

EXHIBIT 15

Short Message Report

| | |
|----------------------|-----------------------------------|
| Conversations: 1 | Participants: 3 |
| Total Messages: 1033 | Date Range: 12/5/2018 - 4/28/2021 |

Outline of Conversations




+19522203642 • 1033 messages between 12/5/2018 - 4/28/2021 • Austin Storms <+19853776257> • Austin Storms <austinmichael.storms@gmail.com> • Ben Hakes <+19522203642>

TX014

BearBox v. Lancium
21-cv-00534

Messages in chronological order (times are shown in GMT -05:00)

 **+19522203642**

AS **Austin Storms <+19853776257>** 12/5/2018, 4:12 PM
Didn't forget about the one page, just been drowning over the last few days. When I get home tonight I'll put it all together and send something over

BH **Ben Hakes <+19522203642>** 12/5/2018, 4:14 PM
no worries - just whenever you can get to it

AS **Austin Storms <+19853776257>** 12/17/2018, 1:01 PM
Hey Ben, have you sent over that NDA yet? Haven't seen it and touching base.
A

AS **Austin Storms <+19853776257>** 12/18/2018, 3:07 PM
Call me when you get a chance. I've got a guy who can get us a meeting with Elon's gatekeeper for the load as a service renewables re: solar, Gigafactory, batteries, and the whole deal.

BH **Ben Hakes <+19522203642>** 12/18/2018, 8:53 PM
Hey - let me ring you tomorrow. Interested to hear more.

AS **Austin Storms <+19853776257>** 12/18/2018, 8:55 PM
Sure thing 👍

AS **Austin Storms <+19853776257>** 1/10/2019, 1:59 PM
So I've been working on an idea that ties together some of our ideas re: "load as a service," BearBox, mining pools, and some of the U.S. based exchanges.

BH **Ben Hakes <+19522203642>** 1/11/2019, 9:35 AM
You around later this afternoon? I've got a bit of a drive and could call you.

AS **Austin Storms <+19853776257>** 1/11/2019, 10:12 AM
Should be, just gimme a shout.

BH **Ben Hakes <+19522203642>** 1/11/2019, 10:12 AM
will do 👍

AS **Austin Storms <+19853776257>** 1/12/2019, 12:47 PM
Hey man, I got busy yesterday afternoon and didn't get a chance to call back before dinner - are you free any today?

BH **Ben Hakes <+19522203642>** 1/12/2019, 3:20 PM
No prob - not free today but am free tomorrow during the day

AS **Austin Storms <+19853776257>** 1/12/2019, 3:28 PM
Okay - tmrw at 11CST work?

Was in NYC at the end of the year hanging out with Marty - he's got some interesting ideas about Betterhash implemented by a pool instead of stratum, and it kind of ties everything together (LaaS, BearBox, renewables).

BH **Ben Hakes <+19522203642>** 1/12/2019, 7:06 PM
Ya that works. I'll be on the road but hit my cell up.

AS **Austin Storms <+19853776257>** 1/12/2019, 7:06 PM
Liked "Ya that works. I'll be on the road but hit my cell up."

AS Austin Storms <+19853776257> 1/25/2019, 2:24 PM
Wrote up the full management console for BearBox (working on some auto logic now). You said you're on the iOS track in Lambda, right?

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BH Ben Hakes <+19522203642> 1/26/2019, 10:51 AM
Dude - that's sick. And yes! This would be super nice on mobile too.

BH Ben Hakes <+19522203642> 1/26/2019, 10:55 AM
This might be a fun project to work on during a build week.

AS Austin Storms <+19853776257> 1/26/2019, 10:57 AM
Absolutely. What you see there is 100% python - about 5,000 lines. I'll be testing the auto functionality once I finish the logic for it - gonna be slick.

BH Ben Hakes <+19522203642> 1/26/2019, 11:03 AM
Love it. I've got an iOS project ideas list going for when I get free time - this is going to move up near the top. I think in a month or so I get to pick what projects I work on. I'm more interested in commercial/industrial apps right now so this would be a perfect fit.

AS Austin Storms <+19853776257> 1/26/2019, 11:05 AM
Solid - I like the commercial industrial stuff too, it's practical and gets shit done.

BH Ben Hakes <+19522203642> 1/26/2019, 11:22 AM
Exactly.

AS Austin Storms <+19853776257> 2/5/2019, 5:32 PM
Yo Ben! Got time later this week to catchup on BearBox and LaaS?

BH Ben Hakes <+19522203642> 2/5/2019, 10:49 PM
Hey man - yes, let's catch up sometime on Friday afternoon 3:30-5 CT is open.

AS Austin Storms <+19853776257> 2/6/2019, 12:00 AM
Solid, I'll call you at 3:30 Friday

BH Ben Hakes <+19522203642> 2/6/2019, 3:36 PM
Liked "Solid, I'll call you at 3:30 Friday"

BH Ben Hakes <+19522203642> 2/8/2019, 4:27 PM
Mind if we push back 10 mins? I can call you.

AS Austin Storms <+19853776257> 2/8/2019, 4:28 PM
Sure thing omw home now

BH Ben Hakes <+19522203642> 2/8/2019, 4:28 PM
Sounds good

BH Ben Hakes <+19522203642> 2/8/2019, 5:54 PM
Talked to Dan (GP CEO), he said the FERC filings are going out today so we should be able to have substantive conversations with him Monday or Tuesday. I'm thinking of trying him in the afternoon Tuesday and looping you into the call - sounds like 100+ MW of wind for a couple of cents.

AS Austin Storms <+19853776257> 2/8/2019, 7:25 PM
Yea sounds great. Just lemme know when and I'll clear my sched

BH Ben Hakes <+19522203642> 2/8/2019, 7:56 PM
Liked "Yea sounds great. Just lemme know when and I'll clear my sched"

AS Austin Storms <+19853776257> 2/13/2019, 11:40 AM
<https://www.theblockcrypto.com/2019/02/13/asic-chip-technology-is-renewable-energys-future/>

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BH Ben Hakes <+19522203642> 2/14/2019, 7:57 PM
Yo - I was going to give Dan a ring tomorrow and talk a little more about the specific West Texas site they have and some of the requirements. My thought was to call around 2:30 CT. You around then?

BH Ben Hakes <+19522203642> 2/14/2019, 7:59 PM
Also, according to Dan, whichever party is the owner of the wind farm will also have to consume the power.

BH Ben Hakes <+19522203642> 2/14/2019, 8:08 PM
I.e., if I'm understanding what Dan is saying correctly, GlidePath would not send LAAS entity a bill for power.

BH Ben Hakes <+19522203642> 2/14/2019, 8:11 PM
Obviously this would need to be made up for in the form of a sort of lease payment.

AS Austin Storms <+19853776257> 2/14/2019, 8:20 PM
Yes can do 2:30 CST

AS Austin Storms <+19853776257> 2/14/2019, 8:20 PM
Have a lunch meeting at 1 but should be done by then

AS Austin Storms <+19853776257> 2/14/2019, 8:20 PM
I'll read the rest when I'm home and reply

BH Ben Hakes <+19522203642> 2/14/2019, 8:29 PM
Liked "I'll read the rest when I'm home and reply"

AS Austin Storms <+19853776257> 2/14/2019, 9:02 PM
Interesting with owner consumption req. - might have to get creative.

AS Austin Storms <+19853776257> 2/18/2019, 11:06 AM
Get a chance to clean up your model this weekend?

BH Ben Hakes <+19522203642> 2/18/2019, 11:39 AM
I started cleaning things up but then the weekend got away from me. Look for something later this evening. BTW, what's the best email to send files to?

AS Austin Storms <+19853776257> 2/18/2019, 11:39 AM
Same here - austin@bearbox.io is best

AS Austin Storms <+19853776257> 2/25/2019, 4:42 PM
Wanna walk through this spreadsheet with you when you get a chance - I've got a few questions on some things.

AS Austin Storms <+19853776257> 2/25/2019, 6:43 PM
Also LaaS is 100% viable as a business model re: Bitcoin mining, I've got a very reputable group who wants "off-grid"

electricity in the \$.025/kWh range.

BH Ben Hakes <+19522203642> 2/25/2019, 6:44 PM
Liked "Wanna walk through this spreadsheet with you when you get a chance - I've got a few questions on some things."

BH Ben Hakes <+19522203642> 2/25/2019, 6:45 PM
How is your schedule looking tomorrow?

AS Austin Storms <+19853776257> 2/25/2019, 6:46 PM
Wide open, just working on some design stuff

BH Ben Hakes <+19522203642> 2/25/2019, 6:54 PM
cool - I'll try you sometime after 3 central

AS Austin Storms <+19853776257> 2/25/2019, 7:06 PM
Solid tty then

BH Ben Hakes <+19522203642> 2/26/2019, 3:57 PM
Getting swamped today - you around in the am tomorrow? Got an email from Dan asking about next steps.

AS Austin Storms <+19853776257> 2/26/2019, 3:59 PM
Yep - holler at me tmrw morning. Got a single 13.2kV to 416Y/240 transformer quote in - working on bulk pricing there.

Gotta figure out from Dan the exact infrastructure existing and what'd be required (above and beyond the pad mount transformers).

BH Ben Hakes <+19522203642> 2/26/2019, 4:00 PM
Noice.

AS Austin Storms <+19853776257> 2/26/2019, 4:00 PM
Working on some modeling for mining profitability through May 2020 as well - there's a decent model - but best is arbit'ing power from \$.02 to \$.025, etc.

BH Ben Hakes <+19522203642> 2/26/2019, 4:01 PM
He's not going to know for sure but he can get the process moving.

BH Ben Hakes <+19522203642> 2/26/2019, 4:02 PM
We just have to come to him with a request for X MWs at \$0.0X

BH Ben Hakes <+19522203642> 2/26/2019, 4:02 PM
Following, or not following the wind

BH Ben Hakes <+19522203642> 2/26/2019, 4:03 PM
Then he can go huddle with his team and see if they can get that done and what else they'd need to charge for.

BH Ben Hakes <+19522203642> 2/26/2019, 4:04 PM
Oh and we need to give him a sense for the amount of acres we need based on the MW request.

AS Austin Storms <+19853776257> 2/26/2019, 4:04 PM
We need the maximum capacity that's available by following the wind across the different sites. If that ends up as 35-40 MW out of a total 160 MW, I can fill it with Bitcoin miners at \$.025 - \$.0275

BH Ben Hakes <+19522203642> 2/26/2019, 4:05 PM
Whats the lead time on 2MW vs. 10MW vs. 40MW?

BH Ben Hakes <+19522203642> 2/26/2019, 4:07 PM
Is the longest lead time the miners or fabing the containers at that point?

AS Austin Storms <+19853776257> 2/26/2019, 4:07 PM
Transformer lead time is 10-12 weeks, shipping from S. Carolina.

AS Austin Storms <+19853776257> 2/26/2019, 4:08 PM
That's the longest - site prep is 2 weeks of line work and concrete for trans.

AS Austin Storms <+19853776257> 2/26/2019, 4:08 PM
3 BearBoxes every 8-10 weeks at 1 MW each

AS Austin Storms <+19853776257> 2/26/2019, 4:08 PM
So lead time for 3 MW is prob 14 weeks conservatively

AS Austin Storms <+19853776257> 2/26/2019, 4:09 PM
10 MW at 16-20 weeks maximum

AS Austin Storms <+19853776257> 2/26/2019, 4:10 PM
40 MW is 8-10 months depending on infra requirements on-site

BH Ben Hakes <+19522203642> 2/26/2019, 4:13 PM
How large a footprint for 3MW

AS Austin Storms <+19853776257> 2/26/2019, 4:18 PM
.5 acres

AS Austin Storms <+19853776257> 2/26/2019, 4:19 PM
93' W x 207' L

BH Ben Hakes <+19522203642> 2/26/2019, 4:19 PM
not including the transformers?

AS Austin Storms <+19853776257> 2/26/2019, 4:20 PM
Including - actually 95'x209'

AS Austin Storms <+19853776257> 2/26/2019, 4:21 PM

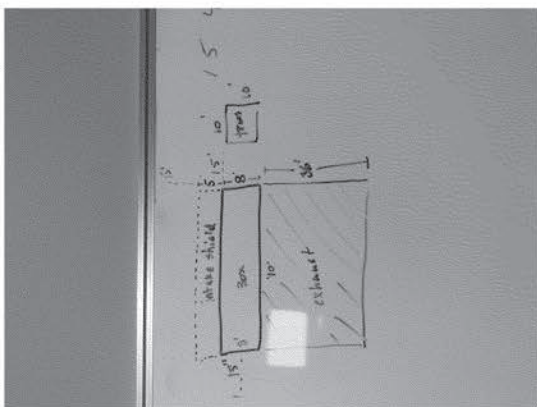


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BH Ben Hakes <+19522203642> 2/26/2019, 4:24 PM
Ok cool

AS Austin Storms <+19853776257> 2/26/2019, 7:07 PM

What time you wanna setup a call tmrw morning? I'm good til 10am, then have a meeting with a structural engineer.

This project is going to move very fast once everyone's on the same page.

BH Ben Hakes <+19522203642> 2/26/2019, 7:53 PM
Let's talk at 9am

AS Austin Storms <+19853776257> 2/26/2019, 7:54 PM
Perfect, call you then.

AS Austin Storms <+19853776257> 2/28/2019, 5:23 PM
Yo! Did you call last night? Just saw I had a missed from you.

BH Ben Hakes <+19522203642> 2/28/2019, 5:24 PM
Haha ya sry - was in the car dialing a bunch of random people

BH Ben Hakes <+19522203642> 2/28/2019, 5:24 PM
I was gonna text you saying so, but then I thought, don't text and drive man.

AS Austin Storms <+19853776257> 2/28/2019, 5:24 PM
Laughed at "I was gonna text you saying so, but then I thought, don't text and drive man."

AS Austin Storms <+19853776257> 2/28/2019, 5:25 PM
I'm in bumper to bumper Mardi Gras traffic right now myself

AS Austin Storms <+19853776257> 2/28/2019, 5:25 PM
Wanna setup an intro call with you, me, Tom, and Todd Garland if you're up for it. Maybe Monday/Tuesday

BH Ben Hakes <+19522203642> 2/28/2019, 5:26 PM
Ha! Be safe my man! Yeah sounds good.

AS Austin Storms <+19853776257> 2/28/2019, 5:26 PM
Either day work better for you? Time?

BH Ben Hakes <+19522203642> 2/28/2019, 5:27 PM
Tuesday morning before 10a probably best otherwise Tuesday afternoon

AS Austin Storms <+19853776257> 2/28/2019, 5:28 PM
Okay I'll set it up and let you know

BH Ben Hakes <+19522203642> 2/28/2019, 5:30 PM
Liked "Okay I'll set it up and let you know "

AS Austin Storms <+19853776257> 2/28/2019, 5:43 PM
Tuesday morning 9-10 CST, Tom's getting us a conf line and I'll send over the details when I get them.

BH Ben Hakes <+19522203642> 2/28/2019, 5:46 PM
Sounds good - I'll look for that.

AS Austin Storms <+19853776257> 2/28/2019, 6:04 PM
Tue, Mar 5, 2019 10:00 AM - 10:30 AM EST

Please join my meeting from your computer, tablet or smartphone.
<https://global.gotomeeting.com/join/485026109>

You can also dial in using your phone.
United States: +1 (872) 240-3412 <tel:+18722403412,,485026109%23>

Access Code: 485-026-109

AS Austin Storms <+19853776257> 3/4/2019, 1:03 PM
Confirming our call tmrw morning @ 9CST

BH Ben Hakes <+19522203642> 3/4/2019, 2:32 PM
thanks - confirmed.

AS Austin Storms <+19853776257> 3/4/2019, 3:11 PM
Solid - Tom sent me some literature on Todd for us to look over. He's legit and the \$\$\$ behind their project 1

AS Austin Storms <+19853776257> 3/4/2019, 3:11 PM
<https://mixergy.com/interviews/buysellads-todd-garland-interview/>

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BH Ben Hakes <+19522203642> 3/4/2019, 3:23 PM
Cool. Any idea on Tom's background? Is he the one managing the existing project?

AS Austin Storms <+19853776257> 3/4/2019, 4:26 PM
I'll ask him -

AS Austin Storms <+19853776257> 3/4/2019, 4:35 PM
<https://www.linkedin.com/in/tommasiero>

BH Ben Hakes <+19522203642> 3/4/2019, 4:36 PM
Liked "<https://www.linkedin.com/in/tommasiero>"

BH Ben Hakes <+19522203642> 3/4/2019, 4:38 PM
Are these the guys that were trying to sell to high-net worth individuals

AS Austin Storms <+19853776257> 3/4/2019, 5:17 PM
Yes - only accredited

AS Austin Storms <+19853776257> 3/4/2019, 5:18 PM
Got time for a 10 min call?

BH Ben Hakes <+19522203642> 3/4/2019, 5:20 PM
Ya call whenever

AS Austin Storms <+19853776257> 3/4/2019, 6:14 PM

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AS Austin Storms <+19853776257> 3/4/2019, 6:14 PM

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BH Ben Hakes <+19522203642> 3/4/2019, 7:04 PM
Emphasized a movie

BH Ben Hakes <+19522203642> 3/4/2019, 7:05 PM
Holy s***!!

AS Austin Storms <+19853776257> 3/4/2019, 7:06 PM
Dude it is absolute insanity on all accounts

BH Ben Hakes <+19522203642> 3/4/2019, 7:40 PM
Straight up Matrix rave

BH Ben Hakes <+19522203642> 3/4/2019, 7:46 PM
<https://www.youtube.com/watch?v=FwbwEZtpEZU&feature=youtu.be>

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BH Ben Hakes <+19522203642> 3/4/2019, 7:47 PM
^^ thought of this immediately

AS Austin Storms <+19853776257> 3/5/2019, 10:01 AM
Just hopped on the call

BH Ben Hakes <+19522203642> 3/5/2019, 10:01 AM
Me too

AS Austin Storms <+19853776257> 3/5/2019, 10:13 AM
Rejoining call

AS Austin Storms <+19853776257> 3/5/2019, 11:33 AM
Let's try and setup a call w Dan, Tom, Todd, you, and me ASAP

BH Ben Hakes <+19522203642> 3/6/2019, 10:38 AM
Floating it by them... will let you know.

AS Austin Storms <+19853776257> 3/6/2019, 10:40 AM
Liked "Floating it by them... will let you know."

BH Ben Hakes <+19522203642> 3/6/2019, 10:43 AM
if anything, hopefully the fact that someone is interested will increase engagement

AS Austin Storms <+19853776257> 3/6/2019, 10:49 AM
That's what I'm thinking as well - energy attracts energy

BH Ben Hakes <+19522203642> 3/6/2019, 10:50 AM
Tuning forks

AS Austin Storms <+19853776257> 3/6/2019, 10:50 AM

~~100~~

BH Ben Hakes <+19522203642> 3/6/2019, 11:05 AM
can you give me a ball-park of the cost for ~12MWs on your end

BH Ben Hakes <+19522203642> 3/6/2019, 11:05 AM
need to get a sense of the check size were talking

AS Austin Storms <+19853776257> 3/6/2019, 11:09 AM
The 40' high cube containers for S9s and 12 MW total (without machines purchased) are ~\$175k each - so \$2.1m there.
Transformers are \$22k each - \$264k total.

BH Ben Hakes <+19522203642> 3/6/2019, 11:10 AM
how about with machines

AS Austin Storms <+19853776257> 3/6/2019, 11:11 AM
The 40' design is for 648 S9s - you might be able to get them for \$150-200 each in bulk - so \$130k max

BH Ben Hakes <+19522203642> 3/6/2019, 11:12 AM
so maybe ~\$2.5-2.6 mil prior to site prep

BH Ben Hakes <+19522203642> 3/6/2019, 11:12 AM
?

AS Austin Storms <+19853776257> 3/6/2019, 11:13 AM
Yep - with the S9 or similar power draw (1,450w) machines.

AS Austin Storms <+19853776257> 3/6/2019, 11:14 AM
But realistically, I think the Whatsminer M10 is the best bet for mining post block subsidy halving at the end of May 2020.

AS Austin Storms <+19853776257> 3/6/2019, 11:15 AM
Those container are 1.5MW each and are ballparked at \$220k each

AS Austin Storms <+19853776257> 3/6/2019, 11:15 AM
But machine costs are still too high around \$850 per machine

BH Ben Hakes <+19522203642> 3/6/2019, 11:15 AM
so either buy s9s now then have to replace them post halving and take price risk on Whatsminer M10

BH Ben Hakes <+19522203642> 3/6/2019, 11:16 AM
or buy whatsminer M10 now

AS Austin Storms <+19853776257> 3/6/2019, 11:16 AM
I would negotiate hard on M10 pricing, otherwise you'll have to change PDUs, feeder breakers, etc.

AS Austin Storms <+19853776257> 3/6/2019, 11:17 AM
If we could get \$500/M10, I'd do it all day, every day.

BH Ben Hakes <+19522203642> 3/6/2019, 11:17 AM
How many S9s for 12MW? vs. How many M10s for 12 MW?

AS Austin Storms <+19853776257> 3/6/2019, 11:19 AM
Containers
648*1400w for S9s
~600*2,100w for M10

AS Austin Storms <+19853776257> 3/6/2019, 11:19 AM
~8,000 S9s or 5,700 M10s

AS Austin Storms <+19853776257> 3/6/2019, 11:20 AM
116 PH/s vs 188 PH/s theoretically

BH Ben Hakes <+19522203642> 3/6/2019, 11:20 AM
okay cool

AS Austin Storms <+19853776257> 3/6/2019, 11:22 AM

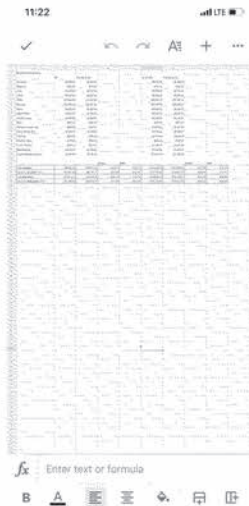


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AS Austin Storms <+19853776257> 3/6/2019, 11:23 AM

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Attachment: ~/Library/SMS/Attachments/93/03/68813EB0-2D6B-4DA7-9DEA-B4FE4FA971FF/SaleQuotePadmount SO-23169 for BearboxLLC.pdf (247 KB)

AS Austin Storms <+19853776257> 3/6/2019, 11:24 AM
Ballpark transformer quotes from Maddox - can pass on to Dan and his team to get any changes/required specs to infra on site - I think I remember him saying that turbine were primary voltage at 13.2kV

BH Ben Hakes <+19522203642> 3/6/2019, 11:26 AM
Liked "Ballpark transformer quotes from Maddox - can pass on to Dan and his team to get any changes/required specs to infra on site - I think I remember him saying that turbine were primary voltage at 13.2kV"

BH Ben Hakes <+19522203642> 3/6/2019, 11:26 AM
I think that's what he said.

BH Ben Hakes <+19522203642> 3/6/2019, 11:27 AM
I think it's more likely that they would pay those costs and then they would be charged back in the form of rent to LAAS

AS Austin Storms <+19853776257> 3/6/2019, 11:28 AM
Then those should work - I've got another few quote requests in to transformer companies, waiting to get the written quotes though.

Maddox has done work with some BTC miners before - the transformers will be "daisy chained"

AS Austin Storms <+19853776257> 3/6/2019, 11:28 AM
 Liked "I think it's more likely that they would pay those costs and then they would be charged back in the form of rent to LAAS"

BH Ben Hakes <+19522203642> 3/7/2019, 9:58 AM
 Couple of things you are welcome to communicate to Todd and Tom:

BH Ben Hakes <+19522203642> 3/7/2019, 9:59 AM
 - I'm working on getting an NDA so as to facilitate a conversation between the two groups

BH Ben Hakes <+19522203642> 3/7/2019, 10:00 AM
 - Dan's preference would be to skip the term sheet and go straight to contract

BH Ben Hakes <+19522203642> 3/7/2019, 10:02 AM
 - They're not sure that 2 cents is "a dog that will hunt". They haven't told me an exact number but seems more like upper 2 cents to 3 cents is more realistic

BH Ben Hakes <+19522203642> 3/7/2019, 10:04 AM
 - A high-level estimate of the uptime was done at the largest of the sites

BH Ben Hakes <+19522203642> 3/7/2019, 10:05 AM

| AVG | 23 MW |
|-------|-------|
| 1 MW | 76% |
| 2 MW | 73% |
| 3 MW | 71% |
| 4 MW | 69% |
| 5 MW | 67% |
| 10 MW | 60% |
| 20 MW | 47% |

Image: ~/Library/SMS/Attachments/65/05/4C60147F-0CA5-42AE-9D85-50A24A4F7F9B/Screen Shot 2019-03-07 at 9.03.27 AM.jpeg (15 KB)

AS Austin Storms <+19853776257> 3/7/2019, 10:08 AM
 Will forward to Tom and Todd

AS Austin Storms <+19853776257> 3/7/2019, 10:09 AM
 Is that a 23MW site with uptime per required load?

BH Ben Hakes <+19522203642> 3/7/2019, 10:09 AM
 No I think it's more like a 70+ MW site.

BH Ben Hakes <+19522203642> 3/7/2019, 10:10 AM
 But it is the uptime per required load, yes.

BH Ben Hakes <+19522203642> 3/7/2019, 10:15 AM
Lost you

AS Austin Storms <+19853776257> 3/8/2019, 3:03 PM
Any updates on NDA/phone conf?

BH Ben Hakes <+19522203642> 3/9/2019, 8:45 AM
Did you talk with them? I was gonna wait on the NDA/phone conf until we got there feedback on the high-level data and pricing. Just thought that they might not be interested at \$.0275 and maybe sub 10MW

AS Austin Storms <+19853776257> 3/9/2019, 9:21 AM
I just sent this to Tom - The wind farm isn't going to be feasible for the project you guys are doing. High level data is showing ~\$.026-0.275/kWh and variable uptime based on seasonality and wind patterns.

It might make sense down the road for individual container placements on sites with high uptime (90%+) and lower load (sub 2MW), but IMHO that's a longer timeline than what you guys are working to scale to pre-halving 2020.

Long story short: the HODL Ranch is a better business decision given all of the current data that's available to me - with the only exception being infrastructure mobility.

AS Austin Storms <+19853776257> 3/9/2019, 9:29 AM
I talked with him about it several days ago and was aware of the higher-level data but not the hard pricing at \$.0275/kWh - that's going to make it hard to compete w/ projects like the HODL Ranch in Midland, TX - they're selling at \$.024/kWh on the deregulated Oncor grid w/ a private 110 MVA substation in phase 1.

I still don't like non-mobile infrastructure because operators have ~no recourse against utility companies/jurisdictional pressure, but some folks right now simply don't care about adversarially designing their infrastructure, i.e. a "decentralized" operation where the ~5-10% is spread amongst 20 different sites and geographic locations.

AS Austin Storms <+19853776257> 3/9/2019, 9:30 AM
👍 that last one was just from me to you.

BH Ben Hakes <+19522203642> 3/9/2019, 9:31 AM
Liked "I just sent this to Tom - The wind farm isn't going to be feasible for the project you guys are doing. High level data is showing ~\$.026-0.275/kWh and variable uptime based on seasonality and wind patterns.

It might make sense down the road for individual container placements on sites with high uptime (90%+) and lower load (sub 2MW), but IMHO that's a longer timeline than what you guys are working to scale to pre-halving 2020.

Long story short: the HODL Ranch is a better business decision given all of the current data that's available to me - with the only exception being infrastructure mobility."

BH Ben Hakes <+19522203642> 3/9/2019, 9:32 AM
Liked "I talked with him about it several days ago and was aware of the higher-level data but not the hard pricing at \$.0275/kWh - that's going to make it hard to compete w/ projects like the HODL Ranch in Midland, TX - they're selling at \$.024/kWh on the deregulated Oncor grid w/ a private 110 MVA substation in phase 1.

I still don't like non-mobile infrastructure because operators have ~no recourse against utility companies/jurisdictional pressure, but some folks right now simply don't care about adversarially designing their infrastructure, i.e. a "decentralized" operation where the ~5-10% is spread amongst 20 different sites and geographic locations."

AS Austin Storms <+19853776257> 3/9/2019, 9:37 AM
The trade off with HODL Ranch vs. any other renewable solution is adversarial infrastructure design re: diversifying operations across different geographic locations to withstand utility collusion and/or jurisdictional pressure.

Large scale projects typically receive a good bit of media attention and IMHO that's not a great thing in this industry - especially when the price of bitcoin goes back up and everyone's making money - and the local politicians, etc. want a bigger piece of the pie than was originally negotiated.


These are the types of things that I think about that some ppl simply don't consider. Just my \$.02 (no pun intended).


BH Ben Hakes <+19522203642> 3/9/2019, 9:37 AM
Let me know how they respond. Happy to keep the ball moving if there's still interest but also want to be sensitive to

GlidePath to not waste time on a lead that's not really interested.

- BH Ben Hakes <+19522203642> 3/9/2019, 9:38 AM
Liked "The trade off with HODL Ranch vs. any other renewable solution is adversarial infrastructure design re: diversifying operations across different geographic locations to withstand utility collusion and/or jurisdictional pressure.

Large scale projects typically receive a good bit of media attention and IMHO that's not a great thing in this industry - especially when the price of bitcoin goes back up and everyone's making money - and the local politicians, etc. want a bigger piece of the pie than was originally negotiated.

These are the types of things that I think about that some ppl simply don't consider. Just my \$.02 (no pun intended)."
- BH Ben Hakes <+19522203642> 3/9/2019, 9:38 AM
Agreed. You'd pay something for that privacy.
- AS Austin Storms <+19853776257> 3/9/2019, 9:38 AM
I agree - not trying to waste anybody's time here. Has GP sent you any detailed generation data?
- BH Ben Hakes <+19522203642> 3/9/2019, 9:39 AM
The goal is to be rich and unknown.
- BH Ben Hakes <+19522203642> 3/9/2019, 9:39 AM
Haha
- AS Austin Storms <+19853776257> 3/9/2019, 9:39 AM
Loved "The goal is to be rich and unknown."
- AS Austin Storms <+19853776257> 3/9/2019, 9:39 AM
That's always been my goal. I don't care about the fame, just the fortune.
- BH Ben Hakes <+19522203642> 3/9/2019, 9:40 AM

- BH Ben Hakes <+19522203642> 3/9/2019, 9:41 AM
I've requested the more detailed info... it needs to get dug out if a deal is to be done by any party. I'll bug them about it next week.
- AS Austin Storms <+19853776257> 3/9/2019, 9:42 AM
Liked "I've requested the more detailed info... it needs to get dug out if a deal is to be done by any party. I'll bug them about it next week."
- AS Austin Storms <+19853776257> 3/9/2019, 9:45 AM
We really just need hard numbers to see if it's feasible. Short-term, there will be better options than \$0.0275/kWh, but that's still competitive long term.

We have to see if LaaS makes sense with reduced margin from \$0.02 to \$0.0275 as well - I'm sure it does at scale, but until then we have time and associated opportunity costs that I don't think either of us want to waste.
- AS Austin Storms <+19853776257> 3/9/2019, 9:49 AM
I'm getting a sense of why Dan would want to keep this "in house" though - this is how I think anti-fragile "dark" mining pools will be run over the next 5+ years when jurisdictional pressure reaches a boiling point re: sovereign vs. non-sovereign currency and wealth.
- AS Austin Storms <+19853776257> 3/9/2019, 9:50 AM
 and that has a lot of value if done correctly.
- AS Austin Storms <+19853776257> 3/10/2019, 6:49 PM

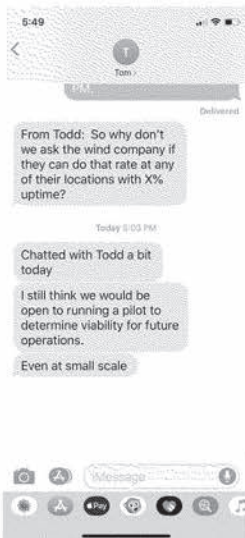


Image: ~/Library/SMS/Attachments/12/02/33792ED1-A370-4731-9F19-5E3C44F9F3D1/IMG_0988.PNG (530 KB)

- AS **Austin Storms <+19853776257>** 3/10/2019, 6:51 PM
From Tom earlier today - I haven't responded yet.

I previously told them that my opinion was HODL Ranch is their best option because of 90% uptime at \$0.024/kWh and they're still interested in doing something small scale.
- AS **Austin Storms <+19853776257>** 3/12/2019, 12:53 PM
Any word from Dan on data, etc?
- BH **Ben Hakes <+19522203642>** 3/12/2019, 1:14 PM
Haven't heard back since last week - I'll follow up this afternoon
- AS **Austin Storms <+19853776257>** 3/12/2019, 1:43 PM
Okay cool, just checking in.
- BH **Ben Hakes <+19522203642>** 3/13/2019, 8:19 AM
<http://www.bostonblockchaincommunity.com/>
- File "58df262f-fc69-4cb8-b9b6-636eea847b4a.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/64/04/29BDA94F-FB80-4644-A56E-69930EEB8687/99469C25-FA76-4BB2-A5D6-7213C3488817.pluginPayloadAttachment
- AS **Austin Storms <+19853776257>** 3/13/2019, 8:21 AM
Looks like a good event - there are really only two people on that list of speakers who are "qualified" to talk about mining - Steve and Dovey
- BH **Ben Hakes <+19522203642>** 3/13/2019, 8:25 AM
By the power vested in me by nobody I nominate you as speaker.
- AS **Austin Storms <+19853776257>** 3/13/2019, 8:27 AM
Hahaha thanks, but they don't want me there.

I'm an old salty bitcoin Maximalist who'll douse Meltem's shitcoin portfolio in gasoline and light in on stage.
- BH **Ben Hakes <+19522203642>** 3/13/2019, 8:27 AM

BH Ben Hakes <+19522203642> 3/13/2019, 8:27 AM
Haha - that's great

BH Ben Hakes <+19522203642> 3/13/2019, 8:28 AM
Why have a conference about mining shitcoins?

AS Austin Storms <+19853776257> 3/13/2019, 8:29 AM
Idk - I expect Steve to be 100% Bitcoin, everyone else will waste time on alts.

Quantum's about to fire their team and hire me on part time to replace most of them out of their NOLA office - they have a big partnership with a hydro startup in upstate NY called Petawatt.

My one die-on-the-hill requirement was that we only mine BTC.

AS Austin Storms <+19853776257> 3/13/2019, 8:30 AM
Their main sales guy is Andrés - Canaan's rep from Venezuela who lives in Colombia/US now - we're about to have a big "in" to some of Canaan's secret sauce.

BH Ben Hakes <+19522203642> 3/13/2019, 8:30 AM
Liked "Idk - I expect Steve to be 100% Bitcoin, everyone else will waste time on alts.

Quantum's about to fire their team and hire me on part time to replace most of them out of their NOLA office - they have a big partnership with a hydro startup in upstate NY called Petawatt.

My one die-on-the-hill requirement was that we only mine BTC."

BH Ben Hakes <+19522203642> 3/13/2019, 8:31 AM
Sucks for their team but sounds awesome!

BH Ben Hakes <+19522203642> 3/13/2019, 8:32 AM
What's a hydro startup do?

AS Austin Storms <+19853776257> 3/13/2019, 8:32 AM
Yea, they were kind of all over the place (Denver, Austin, CT) - I told them 8 months ago that it would be an issue and it finally became one.

AS Austin Storms <+19853776257> 3/13/2019, 8:32 AM
Liked "What's a hydro startup do?"

BH Ben Hakes <+19522203642> 3/13/2019, 8:33 AM
I'm thinking of some silly "change the world" VC pitch... we're going to change the world one DAM at a time lol

BH Ben Hakes <+19522203642> 3/13/2019, 8:33 AM
Laughed at "Yea, they were kind of all over the place (Denver, Austin, CT) - I told them 8 months ago that it would be an issue and it finally became one."

AS Austin Storms <+19853776257> 3/13/2019, 8:33 AM
Same thing as LaaS - I read thru their private placement docs yesterday afternoon.

Exact. Same. Thing.

BH Ben Hakes <+19522203642> 3/13/2019, 8:34 AM
DAMN (pun slightly intended)

AS Austin Storms <+19853776257> 3/13/2019, 8:34 AM
HAHAHAHAHA

AS Austin Storms <+19853776257> 3/13/2019, 8:34 AM
Basically they're aggregating a portfolio of renewables starting in the St Lawrence seaway area

BH Ben Hakes <+19522203642> 3/13/2019, 8:35 AM
Fuck that takes a lot of capital

AS Austin Storms <+19853776257> 3/13/2019, 8:35 AM
Selling to high load industries identified as bitcoin mining, cannabis hydroponic grow ops, etc.

AS Austin Storms <+19853776257> 3/13/2019, 8:35 AM
They're trying to raise \$8M

BH Ben Hakes <+19522203642> 3/13/2019, 8:35 AM
Oh that's not too bad

BH Ben Hakes <+19522203642> 3/13/2019, 8:36 AM
I was thinking they were gonna buy the damns

AS Austin Storms <+19853776257> 3/13/2019, 8:36 AM
No, they're just brokering power and setting up infra

BH Ben Hakes <+19522203642> 3/13/2019, 8:36 AM
Wow

AS Austin Storms <+19853776257> 3/13/2019, 8:36 AM
200MW phase 1, 340MW total after phase 2

BH Ben Hakes <+19522203642> 3/13/2019, 8:36 AM
Fuck them

BH Ben Hakes <+19522203642> 3/13/2019, 8:36 AM
^jking haha

BH Ben Hakes <+19522203642> 3/13/2019, 8:37 AM
Dang that's some power

BH Ben Hakes <+19522203642> 3/13/2019, 8:38 AM
hearing this makes me want to raise a \$100 mil PE fund to go buy the actual assets

AS Austin Storms <+19853776257> 3/13/2019, 8:38 AM
LET'S FUCKING DO IT

AS Austin Storms <+19853776257> 3/13/2019, 8:39 AM
I told Quantum that I can only do 25 hours a week for them because I have BearBox and our project we're trying to put together.

AS Austin Storms <+19853776257> 3/13/2019, 8:40 AM
I'm a sustainable 80 hour/week kinda guy if I like what I'm doing.

BH Ben Hakes <+19522203642> 3/13/2019, 8:40 AM
Play hard to get - always the right strategy

BH Ben Hakes <+19522203642> 3/13/2019, 8:40 AM
Liked "I'm a sustainable 80 hour/week kinda guy if I like what I'm doing."

BH Ben Hakes <+19522203642> 3/13/2019, 8:40 AM
It's not work if you'd be doing it anyway, right?

AS Austin Storms <+19853776257> 3/13/2019, 8:49 AM
Loved "It's not work if you'd be doing it anyway, right?"

AS Austin Storms <+19853776257> 3/13/2019, 8:49 AM
Exactly - now I just get a part time gig to cover my bills so I can quit selling Bitcoin 😊

AS Austin Storms <+19853776257> 3/13/2019, 8:49 AM
Similar thing to what Marty did with the BuySellAds team

AS Austin Storms <+19853776257> 3/13/2019, 8:54 AM
This is the custom aluminum rack system that I've been working on for the past few weeks - finally done

File "1b8ac6ec-a5e9-4a20-af44-7ae23373c5bb.HEIC" is missing.
Attachment: ~/Library/SMS/Attachments/63/03/B395A106-ACAB-43CA-A1BF-E913B69AA627/IMG_1032.HEIC (2 MB)

File "233600cd-3150-4ca9-873d-c9db4eabcf81.HEIC" is missing.
Attachment: ~/Library/SMS/Attachments/62/02/C4F41395-02DD-49F7-B6E3-E48DE6E5AF99/IMG_1035.HEIC (3 MB)

BH Ben Hakes <+19522203642> 3/13/2019, 9:37 AM
Laughed at "Exactly - now I just get a part time gig to cover my bills so I can quit selling Bitcoin 😊 "

BH Ben Hakes <+19522203642> 3/13/2019, 9:37 AM
She's a beaut.

AS Austin Storms <+19853776257> 3/13/2019, 4:03 PM
Thanks dude. Reduced unused spaces to fit 40% more machines in the 20ft.
Was 192, now 272.

BH Ben Hakes <+19522203642> 3/13/2019, 9:39 PM
Incredible.

BH Ben Hakes <+19522203642> 3/13/2019, 9:40 PM
Packing some serious hashpower in a 20'

AS Austin Storms <+19853776257> 3/15/2019, 10:18 AM
Any updates from Dan or the GlidePath team?

BH Ben Hakes <+19522203642> 3/15/2019, 9:31 PM
Hey - just getting settled after a day of travel. I'm working through Dan's team for the data but they're saying it's going to take "longer". I didn't want to push over email so I'll need to call them, possibly follow up w/ Dan if I'm still stuck. They're claiming it's not available in as granular a form as we need. Gonna get to the bottom of it.

AS Austin Storms <+19853776257> 3/15/2019, 10:01 PM
Liked "Hey - just getting settled after a day of travel. I'm working through Dan's team for the data but they're saying it's going to take "longer". I didn't want to push over email so I'll need to call them, possibly follow up w/ Dan if I'm still stuck. They're claiming it's not available in as granular a form as we need. Gonna get to the bottom of it."

AS Austin Storms <+19853776257> 3/15/2019, 10:05 PM
All good, just checking in.
Tom and Todd from BuySellAds reached out again and are *still* interested in setting up a phone call w/ us and Dan.

AS Austin Storms <+19853776257> 3/15/2019, 10:07 PM
I'm < 24 hours from killing the deal from the Quantum team - I requested they put everything in an employee contract (two years of vesting, 6 month cliff, double trigger clause) and they balked, said they weren't putting that in writing 😞

AS Austin Storms <+19853776257> 3/15/2019, 10:12 PM
That being said, this industry is still full of super shady characters and I'm glad that you aren't one of them. 🙌

BH Ben Hakes <+19522203642> 3/16/2019, 8:00 AM
Liked "All good, just checking in.
Tom and Todd from BuySellAds reached out again and are *still* interested in setting up a phone call w/ us and Dan."

BH Ben Hakes <+19522203642> 3/16/2019, 8:00 AM
Emphasized "I'm < 24 hours from killing the deal from the Quantum team - I requested they put everything in an employee contract (two years of vesting, 6 month cliff, double trigger clause) and they balked, said they weren't putting that in writing 😞"

BH Ben Hakes <+19522203642> 3/16/2019, 8:04 AM
Ugh, really? 😞 Sorry to hear that. And completely agree- I can't imagine the sketchy inbound you must get. I'll relay the information re: BSA's continued interest to Dan and GP.

AS Austin Storms <+19853776257> 3/16/2019, 8:59 AM
Liked "Ugh, really? 😞 Sorry to hear that. And completely agree- I can't imagine the sketchy inbound you must get. I'll relay the information re: BSA's continued interest to Dan and GP."

AS Austin Storms <+19853776257> 3/16/2019, 9:02 AM
Yea, it's insane - always comes down to me saying "send the BTC" or "sign the contract" - most projects just want to offer long-term partnerships, pick my brain for 30 days, and then disappear.
It's why I had to start requiring consulting pay before I even got on a plane in 2017 🙄

AS Austin Storms <+19853776257> 3/16/2019, 9:03 AM
Thanks for keeping comms open with Dan and BSA - I know Dan previously mentioned that he's interested in more of a pilot with you and me, but I still think there's some value in having them at least talk.

BH Ben Hakes <+19522203642> 3/20/2019, 8:40 AM
Making a little headway on the data acquisition. Will keep you posted.

AS Austin Storms <+19853776257> 3/20/2019, 8:40 AM
Liked "Making a little headway on the data acquisition. Will keep you posted."

AS Austin Storms <+19853776257> 3/20/2019, 10:42 AM
Lmk when you get it and we can start analyzing - BSA guys just texted me and said HODL Ranch deal is dead, don't have any details atm.

AS Austin Storms <+19853776257> 3/22/2019, 12:50 PM
Still on for 1?

BH Ben Hakes <+19522203642> 3/22/2019, 12:51 PM
yup - talking with dennis and chris vickery - they're the guys on the power marketing/pricing side of GlidePath

AS Austin Storms <+19853776257> 3/22/2019, 12:58 PM
Liked "yup - talking with dennis and chris vickery - they're the guys on the power marketing/pricing side of GlidePath"

AS Austin Storms <+19853776257> 3/28/2019, 12:43 PM
About to email you the pricing and scope of work change estimates. Take a look at it when you can, LMK if you have any questions, then we can send to the guys at GlidePath in thread.

BH Ben Hakes <+19522203642> 3/28/2019, 12:44 PM

Was just about to check in - sounds great. Will look over during downtime this weekend.

BH Ben Hakes <+19522203642> 3/28/2019, 12:45 PM
Doing that Bitcoin presentation in Boston Monday night - small group but the Satoshi quote you recommended (..you might want to get some just in case it catches on..) is on the first page 😊

AS Austin Storms <+19853776257> 3/28/2019, 12:46 PM
Liked "Doing that Bitcoin presentation in Boston Monday night - small group but the Satoshi quote you recommended (..you might want to get some just in case it catches on..) is on the first page 😊"

AS Austin Storms <+19853776257> 3/28/2019, 12:46 PM
Excelente

AS Austin Storms <+19853776257> 3/28/2019, 12:46 PM
Just re-listened to Murad's interview on Pomp's podcast from last year as well - he makes some compelling arguments if you're still looking for some singers

AS Austin Storms <+19853776257> 3/28/2019, 12:46 PM
*zingers

BH Ben Hakes <+19522203642> 3/28/2019, 12:47 PM
probably a good idea - like I'm an athlete getting ready for the big game

BH Ben Hakes <+19522203642> 3/28/2019, 12:47 PM
headphones locked in

BH Ben Hakes <+19522203642> 3/28/2019, 12:50 PM
I'll probably just send a heads up to the GP folks that the response is coming sometime next week

AS Austin Storms <+19853776257> 3/28/2019, 12:53 PM
Liked "probably a good idea - like I'm an athlete getting ready for the big game"

AS Austin Storms <+19853776257> 3/28/2019, 12:53 PM
Liked "headphones locked in"

AS Austin Storms <+19853776257> 3/28/2019, 12:54 PM
It's pretty straight forward - 2 tab sheet with a summary pdf.

BH Ben Hakes <+19522203642> 3/28/2019, 12:55 PM
perfect

BH Ben Hakes <+19522203642> 3/29/2019, 10:09 AM
Hey - are you around New Orleans the next few days? Dan happens to be in town for the next couple of days it think.

AS Austin Storms <+19853776257> 3/29/2019, 10:43 AM
Yea I'll be here thru Wednesday

BH Ben Hakes <+19522203642> 3/29/2019, 10:44 AM
Great - you mind if I let Dan know i case he has down time

BH Ben Hakes <+19522203642> 3/29/2019, 10:44 AM
What part of the city are you in

AS Austin Storms <+19853776257> 3/29/2019, 10:45 AM
Sure thing. I live in the Warehouse District, a few blocks east from the Superdome

BH Ben Hakes <+19522203642> 3/29/2019, 10:46 AM

Great. I'll message him. No idea if he's got time but will let you know.

AS Austin Storms <+19853776257> 3/29/2019, 10:46 AM
Liked "Great. I'll message him. No idea if he's got time but will let you know."

BH Ben Hakes <+19522203642> 3/29/2019, 10:46 AM
Also just shot you a response.

BH Ben Hakes <+19522203642> 3/29/2019, 10:46 AM
To your email yesterday

AS Austin Storms <+19853776257> 3/29/2019, 10:51 AM
Looking at it now

BH Ben Hakes <+19522203642> 3/29/2019, 10:52 AM
Liked "Looking at it now"

BH Ben Hakes <+19522203642> 4/3/2019, 2:04 PM
You able to join this meeting?

AS Austin Storms <+19853776257> 4/3/2019, 2:05 PM
I've been on the line but you guys can't hear me, troubleshooting now

BH Ben Hakes <+19522203642> 4/3/2019, 2:05 PM
8666708282,,22358019#

BH Ben Hakes <+19522203642> 4/5/2019, 8:14 AM
Yo was just thinking about this - it'd be super cool to write a little python script that ran on the UPS at the mining site that looked at the LMP (locational margin price) pricing at the grid node that the wind farm feed and power on/off based on whether or not the LMP is above or below, so \$0.03/kWh

BH Ben Hakes <+19522203642> 4/5/2019, 8:14 AM
<https://marketplace.spp.org/file-api/download/rtbm-lmp-by-location?path=%2FRTBM-LMP-SL-latestInterval.csv>

*File "c9d36cf0-6bca-49ab-92ee-29f040bfd00d.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/c8/08/F270DCBF-8E67-42C7-9553-DCA6E0D0ADB4/0079B203-0E47-4D4B-B343-B7934C09E794.pluginPayloadAttachment (946 bytes)*

BH Ben Hakes <+19522203642> 4/5/2019, 8:15 AM
Seems pretty simple to prototype

AS Austin Storms <+19853776257> 4/5/2019, 8:18 AM
What is LMP? Should be pretty easy to incorporate anything if we have an accurate data feed in real time

BH Ben Hakes <+19522203642> 4/5/2019, 8:19 AM
LMP is the price you get for delivering elections to a node on the grid

BH Ben Hakes <+19522203642> 4/5/2019, 8:20 AM
LMPs are usually adjusted in 5-min increments

AS Austin Storms <+19853776257> 4/5/2019, 8:20 AM
Liked "LMPs are usually adjusted in 5-min increments"

BH Ben Hakes <+19522203642> 4/5/2019, 8:20 AM
Electrons* not elections obvi

AS Austin Storms <+19853776257> 4/5/2019, 8:22 AM

That's what I needed to know. Basically just have to clean the format of the consumed data/API so I can add a function that calls and updates the SQLite tbl and does the logic

BH Ben Hakes <+19522203642> 4/5/2019, 8:23 AM
Ya- so if you have a PPA I don't think you care about this...

BH Ben Hakes <+19522203642> 4/5/2019, 8:23 AM
PPA is like a long term swap contract on that nodes LMP

BH Ben Hakes <+19522203642> 4/5/2019, 8:24 AM
(We dont hear about this stuff b/c we mostly pay the retail rates)

AS Austin Storms <+19853776257> 4/5/2019, 8:26 AM
That makes sense - and LMP is measured in \$/MW?

BH Ben Hakes <+19522203642> 4/5/2019, 8:26 AM
Yup

BH Ben Hakes <+19522203642> 4/5/2019, 8:27 AM
Also there's sometimes a thing called a Day-Ahead price, basically a day-ahead forward price that you could lock in

BH Ben Hakes <+19522203642> 4/5/2019, 8:28 AM
Especially important if your operations take a while to get up and running (less so for mining)

AS Austin Storms <+19853776257> 4/5/2019, 8:28 AM
What's the process of locking in day ahead forward price?

BH Ben Hakes <+19522203642> 4/5/2019, 8:29 AM
Think you call / request it with the ISO or grid operator

BH Ben Hakes <+19522203642> 4/5/2019, 8:29 AM
<https://www.iso-ne.com/markets-operations/markets/da-rt-energy-markets>

*File "a05da717-1592-418e-9084-721030c9b9e4.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/ef/15/9DCD58A7-CC43-4C98-8F90-52879012176B/66F5B523-E937-4E13-B0CF-F666EF63F4E5.pluginPayloadAttachment (1 KB)*

BH Ben Hakes <+19522203642> 4/5/2019, 8:31 AM
I think most of the negative pricing happens on the LMP

AS Austin Storms <+19853776257> 4/5/2019, 8:34 AM
Interesting. I'll see about incorporating the LMP data and checks into the current logic and do some unit testing.

BH Ben Hakes <+19522203642> 4/5/2019, 8:36 AM
Cool. I like the pitch if you go to generation owners and say we won't mine over "X" price, so you don't lose out on juicy LMP pricing spikes.

AS Austin Storms <+19853776257> 4/5/2019, 8:38 AM
Absolutely! It's really good thinking - that way they can really maximize their profit.

AS Austin Storms <+19853776257> 4/5/2019, 8:39 AM
Tbh, that might be something we could develop a system for outside of the mining industry and for any other potential diverted power behind grid applications.

BH Ben Hakes <+19522203642> 4/5/2019, 8:43 AM
100

BH Ben Hakes <+19522203642> 4/5/2019, 8:44 AM
Bitcoin enables real-time energy market trading.

AS Austin Storms <+19853776257> 4/5/2019, 8:45 AM
And has the ability to arb any inefficiencies in the production of excess for profit.

BH Ben Hakes <+19522203642> 4/5/2019, 8:45 AM
I mean, prior to this, you don't have a way to take advantage of weird market pricing anomalies in real time

BH Ben Hakes <+19522203642> 4/5/2019, 8:46 AM
Exactly

AS Austin Storms <+19853776257> 4/5/2019, 8:48 AM
And I don't think there's another application that's feasible for incremental monitoring on a 5 minute intervals

AS Austin Storms <+19853776257> 4/5/2019, 8:49 AM
Can you think of any?

BH Ben Hakes <+19522203642> 4/5/2019, 8:51 AM
No, all those data centers need 100% uptime to make sense. I guess if you're running the worlds largest SETI node or trying to find the next prime number

BH Ben Hakes <+19522203642> 4/5/2019, 8:51 AM
Lol

BH Ben Hakes <+19522203642> 4/5/2019, 8:54 AM
Trying to be an ETH full node maybe? Lol

AS Austin Storms <+19853776257> 4/5/2019, 11:36 AM
Laughed at "Trying to be an ETH full node maybe? Lol"

AS Austin Storms <+19853776257> 4/9/2019, 5:06 PM
LMP logic will work.

AS Austin Storms <+19853776257> 4/9/2019, 5:07 PM
And we should design and build something similar for estimating future on-chain transaction fees.

BH Ben Hakes <+19522203642> 4/10/2019, 9:53 PM
Liked "LMP logic will work."

BH Ben Hakes <+19522203642> 4/10/2019, 9:53 PM
That's sick

BH Ben Hakes <+19522203642> 4/10/2019, 9:55 PM
What data were you pulling it from? The one is sent? Would be sick to backtest it over a week or so, build out a mining /hashpower estimation model to calculate revenue potential to GP.

BH Ben Hakes <+19522203642> 4/10/2019, 9:58 PM
Imagine going to someone and saying "yeah, what node are you feeding? We'll tell you how much money you could be making"

AS Austin Storms <+19853776257> 4/10/2019, 10:14 PM
Yea the link you sent - the data comes as a CSV, so I can fetch it at the top of every main() loop, auto-import to a SQLite table, and run logic against whichever metric we want in the data to send commands to the miners within the local IP range specified of the container.

AS Austin Storms <+19853776257> 4/10/2019, 10:19 PM

Did I tell you that I finished integrating the software side of monitoring/maintenance of cgminer with the PDUs?

So it's a fully automated, full hardware/software stack watchdog and sends an email on notification of cgminer restart, IO reboot, manual reboot required, etc.

AS Austin Storms <+19853776257> 4/10/2019, 10:19 PM
And uses about 25% of the system resources of a Raspberry pi going full throttle with .001 sec timeouts on host response.

It is absurd.

BH Ben Hakes <+19522203642> 4/10/2019, 11:21 PM
Loved "Yea the link you sent - the data comes as a CSV, so I can fetch it at the top of every main() loop, auto-import to a SQLite table, and run logic against whichever metric we want in the data to send commands to the miners within the local IP range specified of the container."

BH Ben Hakes <+19522203642> 4/10/2019, 11:21 PM
Emphasized "Did I tell you that I finished integrating the software side of monitoring/maintenance of cgminer with the PDUs?


So it's a fully automated, full hardware/software stack watchdog and sends an email on notification of cgminer restart, IO reboot, manual reboot required, etc. "

BH Ben Hakes <+19522203642> 4/10/2019, 11:23 PM
That's insane.

BH Ben Hakes <+19522203642> 4/10/2019, 11:28 PM
So wait, you can remote kill a a miner on a specific pdu?

BH Ben Hakes <+19522203642> 4/10/2019, 11:28 PM
/ do a hard reset?

AS Austin Storms <+19853776257> 4/10/2019, 11:29 PM
Yes

BH Ben Hakes <+19522203642> 4/10/2019, 11:29 PM


BH Ben Hakes <+19522203642> 4/10/2019, 11:29 PM
Jeeze man. Lol.

BH Ben Hakes <+19522203642> 4/10/2019, 11:31 PM
These things are going be so sick

AS Austin Storms <+19853776257> 4/10/2019, 11:32 PM
At the top of the watchdog loop, it'll import the CSV to a SQL table and check the LMP data against what our threshold price is in the logic, turn off the miners if LMP > threshold.

BH Ben Hakes <+19522203642> 4/10/2019, 11:32 PM
You could arb any grid node and long as you had power and internet.

AS Austin Storms <+19853776257> 4/10/2019, 11:33 PM
Exactly

BH Ben Hakes <+19522203642> 4/10/2019, 11:33 PM
  

BH Ben Hakes <+19522203642> 4/10/2019, 11:37 PM

Now I'm wondering if there's some way to quickly get a power plant (wind, solar, etc) re-wired with the proper transformer

AS Austin Storms <+19853776257> 4/10/2019, 11:37 PM
And I think I could probably build the backend to change which miners were on based on power being generated

BH Ben Hakes <+19522203642> 4/10/2019, 11:38 PM
Liked "And I think I could probably build the backend to change which miners were on based on power being generated"

BH Ben Hakes <+19522203642> 4/10/2019, 11:38 PM
That'd be cool, take only the most power efficient miners possible.

BH Ben Hakes <+19522203642> 4/10/2019, 11:39 PM
Or maybe cycle them

AS Austin Storms <+19853776257> 4/10/2019, 11:46 PM
I meant on site - tie into real time generation data at average 500kW and ebb&flow miners on based on actual power generated so you don't brownout machines

AS Austin Storms <+19853776257> 4/10/2019, 11:46 PM
Does that make sense?

AS Austin Storms <+19853776257> 4/11/2019, 12:11 PM
Let's talk some about the LMP check when you get a chance - I think I can model profitability of mining with LMP logic over a week or so vs. just selling @ LMP.

If so, that's a game changer and we can develop it together to sell the system or full IP to the highest bidder.

AS Austin Storms <+19853776257> 4/11/2019, 12:19 PM
And realistically, the model will use on-site mining data with price API data to dynamically calculate at what LMP selling power back to the grid is more profitable than mining.

That's the real arb.

AS Austin Storms <+19853776257> 4/11/2019, 12:21 PM
^ this can realistically run on a raspberry pi @ < 35% system usage. One of the reasons I'm a Python maniac

BH Ben Hakes <+19522203642> 4/11/2019, 5:54 PM
Liked "Let's talk some about the LMP check when you get a chance - I think I can model profitability of mining with LMP logic over a week or so vs. just selling @ LMP.

If so, that's a game changer and we can develop it together to sell the system or full IP to the highest bidder."

BH Ben Hakes <+19522203642> 4/11/2019, 5:54 PM
Can you talk Friday morning?

BH Ben Hakes <+19522203642> 4/11/2019, 5:58 PM
Laughed at " ^ this can realistically run on a raspberry pi @ < 35% system usage. One of the reasons I'm a Python maniac"

BH Ben Hakes <+19522203642> 4/11/2019, 5:59 PM
Liked "And realistically, the model will use on-site mining data with price API data to dynamically calculate at what LMP selling power back to the grid is more profitable than mining.

That's the real arb."

AS Austin Storms <+19853776257> 4/11/2019, 6:02 PM
Yea call me tmrw morning whenever. Going to do a track workout at 10, but free anytime before than.

BH Ben Hakes <+19522203642> 4/11/2019, 6:14 PM
Cool I'll try you around 9. You working out with your Saints buddies?

AS Austin Storms <+19853776257> 4/11/2019, 6:18 PM
Yep - gonna go to the high school with Mauti, run a bit, and meet the new head football coach and make sure he isn't a schmuck.

AS Austin Storms <+19853776257> 4/11/2019, 6:18 PM
Can't let just anybody seize the reins at our alma mater lol

BH Ben Hakes <+19522203642> 4/11/2019, 6:47 PM
Laughed at "Can't let just anybody seize the reins at our alma mater lol"

BH Ben Hakes <+19522203642> 4/11/2019, 6:48 PM
Lol. Solid. Alright I'll hit you up right at 9.

AS Austin Storms <+19853776257> 4/11/2019, 6:48 PM
Liked "Lol. Solid. Alright I'll hit you up right at 9."

AS Austin Storms <+19853776257> 4/12/2019, 4:23 PM
About to email the basic network watchdog to you - 77 lines of Python 🐍

AS Austin Storms <+19853776257> 4/12/2019, 5:38 PM
Do you have a Bitcoin miner?

BH Ben Hakes <+19522203642> 4/12/2019, 8:15 PM
Liked "About to email the basic network watchdog to you - 77 lines of Python 🐍"

BH Ben Hakes <+19522203642> 4/12/2019, 8:17 PM
🏠 I really like Swift but I do miss Python. Staring it again in a week. I'll take a look.

No bitcoin miners here in Minnesota. I sold my Dragonmints when I left Chicago cuz electricity costs are \$\$\$ here.

AS Austin Storms <+19853776257> 4/13/2019, 11:04 AM
Liked "🏠 I really like Swift but I do miss Python. Staring it again in a week. I'll take a look.

No bitcoin miners here in Minnesota. I sold my Dragonmints when I left Chicago cuz electricity costs are \$\$\$ here."

AS Austin Storms <+19853776257> 4/17/2019, 12:09 PM
Is there anything the GP folks are waiting on from me? Or just LMP modeling Sarah

AS Austin Storms <+19853776257> 4/17/2019, 12:09 PM
data*?

BH Ben Hakes <+19522203642> 4/17/2019, 12:12 PM
Don't think so. They don't know about this LMP modeling thing. I think what we do is prep the modeling the go back to them with a check in and an update on some the work done on the LMP modeling

BH Ben Hakes <+19522203642> 4/17/2019, 12:14 PM
Like: "just wanted to check in and mention that we've been working on a way of integrating the LMPing into the mining operation"

AS Austin Storms <+19853776257> 4/19/2019, 8:04 PM

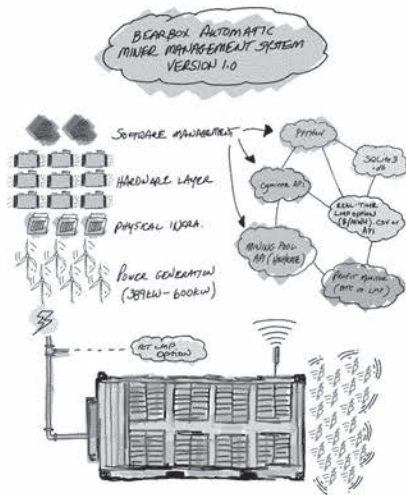


Image: ~/Library/SMS/Attachments/91/01/C9AA0DF2-CDE5-4FE9-9522-F884CCABD9BB/IMG_1394.JPG (447 KB)

| | | |
|----|---|--------------------|
| AS | Austin Storms <+19853776257> Putting together the data architecture for the model this weekend. | 4/19/2019, 8:06 PM |
| BH | Ben Hakes <+19522203642> holy s***! that's cool | 4/20/2019, 1:29 PM |
| BH | Ben Hakes <+19522203642> Loved an image | 4/20/2019, 1:29 PM |
| BH | Ben Hakes <+19522203642> damn that is sexy | 4/20/2019, 1:30 PM |
| AS | Austin Storms <+19853776257> Gonna email that to them with the data modeling once I figure it out | 4/20/2019, 1:31 PM |
| BH | Ben Hakes <+19522203642> i love it | 4/20/2019, 1:32 PM |
| BH | Ben Hakes <+19522203642> I can do a follow up with Mike next week, take their temperature on it | 4/20/2019, 1:33 PM |
| BH | Ben Hakes <+19522203642> also, see if I can get a status update on timing | 4/20/2019, 1:34 PM |
| AS | Austin Storms <+19853776257> Sounds good 🙌 | 4/20/2019, 3:58 PM |
| BH | Ben Hakes <+19522203642> Talked with Mike - sounds like they are still hashing out the details of the real estate title transfer, and he said that we should definitely ping denis and Vickery (cc'ing Mike) if we have more material to share on the LMP API model/design | 4/22/2019, 1:06 PM |
| AS | Austin Storms <+19853776257> For sure. I'll put together the tech arch/specs tonight and see how the model looks. I haven't sent an email to them yet. | 4/22/2019, 1:07 PM |
| BH | Ben Hakes <+19522203642> Yup - I think it'll get the wheels turning on their end. If you can share that IMG I'm sure that'd catch some eyes | 4/22/2019, 1:09 PM |
| AS | Austin Storms <+19853776257> | 4/22/2019, 1:10 PM |

Definitely - I still need to get clarification on real-time LMP vs. day-ahead LMP re: business requirements too.

BH Ben Hakes <+19522203642> 4/22/2019, 1:11 PM
Maybe that's a question to pose in that email as well...

AS Austin Storms <+19853776257> 4/22/2019, 1:15 PM
Yep, definitely. Will send out this afternoon when I get home, currently transitioning one of the permanent facilities.

AS Austin Storms <+19853776257> 4/23/2019, 11:56 AM
I'm running behind on some of the modeling - had an issue with an API that I'm working to fix.

AS Austin Storms <+19853776257> 4/23/2019, 11:57 AM
Also, real time LMP is big time volatile in the dataset I'm using - might just shoot an email over to the GP guys to see if they have a publicly facing csv or api for actual node data

BH Ben Hakes <+19522203642> 4/23/2019, 7:06 PM
Liked "I'm running behind on some of the modeling - had an issue with an API that I'm working to fix."

BH Ben Hakes <+19522203642> 4/23/2019, 7:06 PM
Liked "Also, real time LMP is big time volatile in the dataset I'm using - might just shoot an email over to the GP guys to see if they have a publicly facing csv or api for actual node data"

BH Ben Hakes <+19522203642> 4/23/2019, 7:07 PM
I can ask if you want. I'd probably direct it towards Denis and Vickery.

BH Ben Hakes <+19522203642> 4/23/2019, 7:08 PM
I think Denis will definitely know.

AS Austin Storms <+19853776257> 4/23/2019, 7:18 PM
I got the model running - gonna check it when I get home.

AS Austin Storms <+19853776257> 4/23/2019, 7:58 PM
This is one of the coolest things I've ever put together FYI - thanks for the idea.

Gonna let it run all night and analyze tmrw morning - it's real time LMP vs. network hashrate profitability in 5 min increments. Only one LMP price spike thus far.

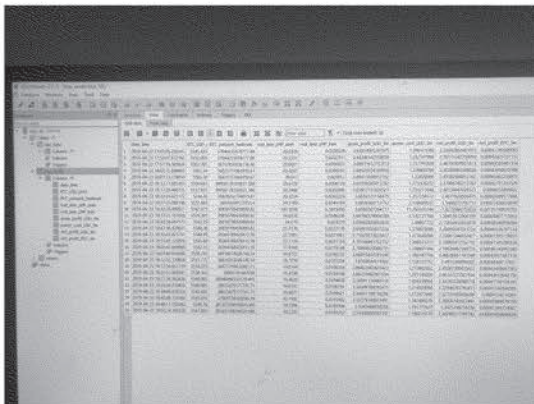


Image: ~/Library/SMS/Attachments/2f15/E4E986DE-8BFD-4F3B-A55C-0D0C3E164752/57776007234__2BB185B5-C6C7-46CD-B355-A20A49854F4D.JPG (5 MB)

BH Ben Hakes <+19522203642> 4/23/2019, 10:40 PM
Loved "This is one of the coolest things I've ever put together FYI - thanks for the idea.

Gonna let it run all night and analyze tmrw morning - it's real time LMP vs. network hashrate profitability in 5 min increments. Only one LMP price spike thus far."

BH Ben Hakes <+19522203642> 4/23/2019, 10:41 PM
Fascinating

BH Ben Hakes <+19522203642> 4/23/2019, 10:44 PM
So if you convert that `net_profit_BTC_5m` to dollars is that the dollar-for-dollar comparison to the real_time_LMP_mwh

BH Ben Hakes <+19522203642> 4/23/2019, 10:45 PM
No, looks like that's just the `net_profit_USD_5m`

AS Austin Storms <+19853776257> 4/23/2019, 10:46 PM
It's a bit of a misnomer

AS Austin Storms <+19853776257> 4/23/2019, 10:46 PM
Net profit USD 5m is BTC/USD value *over* the rt LMP pricing.

BH Ben Hakes <+19522203642> 4/23/2019, 10:48 PM
ok so you'd make about \$3.50 every 5 mins in BTC, and you'd pay about \$1.19

BH Ben Hakes <+19522203642> 4/23/2019, 10:48 PM
for the power

AS Austin Storms <+19853776257> 4/23/2019, 10:48 PM
Correct - the \$1.19 is what the power would be sold back onto the grid for.

BH Ben Hakes <+19522203642> 4/23/2019, 10:49 PM
lol - freakin sweet

BH Ben Hakes <+19522203642> 4/23/2019, 10:49 PM
so you're real time calculating mining profitability

AS Austin Storms <+19853776257> 4/23/2019, 10:49 PM
So you could sell \$1.19 of the BTC mined, cover normal rev, and then risk off the remainder.

They're going to want to lock in some of the cream in USD and risk a % of BTC on inventory.

BH Ben Hakes <+19522203642> 4/23/2019, 10:49 PM
at a particular node on the grid

AS Austin Storms <+19853776257> 4/23/2019, 10:50 PM
Yes yes yes

BH Ben Hakes <+19522203642> 4/23/2019, 10:50 PM
hahaha

AS Austin Storms <+19853776257> 4/23/2019, 10:50 PM
It's a license to print money

BH Ben Hakes <+19522203642> 4/23/2019, 10:51 PM
lol - beautiful

BH Ben Hakes <+19522203642> 4/23/2019, 10:51 PM
so that spike

BH Ben Hakes <+19522203642> 4/23/2019, 10:51 PM
miners would stop for that?

BH Ben Hakes <+19522203642> 4/23/2019, 10:52 PM

at 182

BH Ben Hakes <+19522203642> 4/23/2019, 10:52 PM
(I guess that assumes there's power at the wind farm)

AS Austin Storms <+19853776257> 4/23/2019, 10:53 PM
yep - could either loop over network range and stop cgminer or toggle relays on PDUs to turn everything off.

AS Austin Storms <+19853776257> 4/23/2019, 10:54 PM
takes the miners about 90 secs to reboot to hashing after being turned off.

BH Ben Hakes <+19522203642> 4/23/2019, 10:55 PM
So they start hashing when we come back off the 182 number to 34

AS Austin Storms <+19853776257> 4/23/2019, 10:56 PM
Yes - logic looks at net profit USD column

AS Austin Storms <+19853776257> 4/23/2019, 10:57 PM
Can config to either +/- or set a threshold due to BTC price volatility.

BH Ben Hakes <+19522203642> 4/23/2019, 10:58 PM
Ya - I'm thinking you could have also have some ML in the python script that pattern matches the type of spike

BH Ben Hakes <+19522203642> 4/23/2019, 10:59 PM
like if the model thinks it's going to be a 60 min spike after a couple of observations, then you shut off

BH Ben Hakes <+19522203642> 4/23/2019, 10:59 PM
closer to your threshold

BH Ben Hakes <+19522203642> 4/23/2019, 10:59 PM
vs. like a 5 mins spike at \$65 / MW

BH Ben Hakes <+19522203642> 4/23/2019, 11:00 PM
meh, maybe that's not worth it to shut down and chase

AS Austin Storms <+19853776257> 4/23/2019, 11:01 PM
Absolutely - weather has a lot to do with this rt LMP demand I believe.

I think SPP day ahead market LMP tries to smooth rt LMP volatility, but it kinda sucks at it tbh.

BH Ben Hakes <+19522203642> 4/23/2019, 11:02 PM
ya - that makes sense - so freakin cool!

BH Ben Hakes <+19522203642> 4/23/2019, 11:02 PM
I guess \$0.06 is breakeven eh?

BH Ben Hakes <+19522203642> 4/23/2019, 11:03 PM
although sound like you think their is some funky business going on with the hash rate

AS Austin Storms <+19853776257> 4/23/2019, 11:04 PM
Yea, it's around \$.06-.065 right now I think.

AS Austin Storms <+19853776257> 4/23/2019, 11:04 PM
And there's definitely something weird going on - was just talking with Miles about it.

AS Austin Storms <+19853776257> 4/23/2019, 11:05 PM
15% network hashrate just *disappeared* this morning while I was testing this. It scared the shit out of me because I

thought my modeling was wrong, entered everything manually, and then reran it.

Then checked it against some public unauth APIs and they weren't reporting the hashrate drop yet.

AS Austin Storms <+19853776257> 4/23/2019, 11:07 PM
A lot of people don't realize that hashrate is *estimated* based on network difficulty, expected blocks over 24hrs, and actually blocks over 24hrs.
Some were showing 51 exahash, some are still showing 45 Exahash - but it's 36 right now and was this morning.

BH Ben Hakes <+19522203642> 4/23/2019, 11:12 PM
no blocks for the last half hour

BH Ben Hakes <+19522203642> 4/23/2019, 11:12 PM
...obviously its stochastic

AS Austin Storms <+19853776257> 4/23/2019, 11:12 PM
I think manufacturers are artificially dropping hashrate to make new gen miner offerings look more "profitable" -
they make more money selling machines than self-mining, sell for BTC, more efficient machines decrease overall selling pressure from miners, BTC bull market comes, they make even_more_money.

BH Ben Hakes <+19522203642> 4/23/2019, 11:14 PM
they won't be able to f* with the hash rate when those BearBoxes are just gonna arb that incremental power from the grid

BH Ben Hakes <+19522203642> 4/23/2019, 11:14 PM
😁

AS Austin Storms <+19853776257> 4/23/2019, 11:15 PM
Hahaha whoever it was took 500-900MW offline in ~24 hours - they do what they want.

BH Ben Hakes <+19522203642> 4/23/2019, 11:15 PM
But yeah dude - I don't trust those guys to do anything but what's in their best interest...

AS Austin Storms <+19853776257> 4/23/2019, 11:15 PM
Liked "But yeah dude - I don't trust those guys to do anything but what's in their best interest..."

BH Ben Hakes <+19522203642> 4/23/2019, 11:16 PM
although the Jihan move was a real head scratcher

BH Ben Hakes <+19522203642> 4/23/2019, 11:16 PM
maybe drunk on power

BH Ben Hakes <+19522203642> 4/23/2019, 11:16 PM
or out of touch

AS Austin Storms <+19853776257> 4/23/2019, 11:16 PM
He started playing chess against himself and lost.

BH Ben Hakes <+19522203642> 4/23/2019, 11:16 PM
Laughed at "He started playing chess against himself and lost."

BH Ben Hakes <+19522203642> 4/23/2019, 11:17 PM
self-check mate

AS Austin Storms <+19853776257> 4/23/2019, 11:18 PM
Exactly. You don't play chess against yourself. In positions of power, nobody tells you that you're acting irrational. He

needed a "no man."

AS Austin Storms <+19853776257> 4/23/2019, 11:19 PM
Want me to send you these tables in CSV tmrw so you can dig thru it?

BH Ben Hakes <+19522203642> 4/23/2019, 11:23 PM
Yah that'd be fun - shoot them over. I'd love to see another price spike or two - see what kinda juice you can squeeze outta that

AS Austin Storms <+19853776257> 4/23/2019, 11:24 PM
We had a bunch of spikes this am before I started logging, I'll let it run to lunch and email both over to you tmrw

AS Austin Storms <+19853776257> 4/23/2019, 11:25 PM
I've been writing code for like 15 hours though and I'm going to sleep hahaha tty tmrw

BH Ben Hakes <+19522203642> 4/23/2019, 11:37 PM
Liked "I've been writing code for like 15 hours though and I'm going to sleep hahaha tty tmrw"

BH Ben Hakes <+19522203642> 4/23/2019, 11:37 PM
sounds good man ttys

AS Austin Storms <+19853776257> 4/24/2019, 11:45 AM
Something broke in the modeling script at 4 am... restarting it now. 😊

AS Austin Storms <+19853776257> 4/24/2019, 9:11 PM
Never mind, SPP pulled the real-time LMP CSV down from their site 🤔

BH Ben Hakes <+19522203642> 4/24/2019, 9:15 PM
Questioned "Never mind, SPP pulled the real-time LMP CSV down from their site 🤔"

BH Ben Hakes <+19522203642> 4/24/2019, 9:16 PM
Weird man

AS Austin Storms <+19853776257> 4/24/2019, 9:16 PM
Or they rate limited my IP..?

BH Ben Hakes <+19522203642> 4/24/2019, 9:16 PM
I think I'm gonna call Denis to see if they have a better source

BH Ben Hakes <+19522203642> 4/24/2019, 9:16 PM
Did you try through a VPN?

AS Austin Storms <+19853776257> 4/24/2019, 9:17 PM
I'm going to send an email tonight.

The CSV reappeared thru VPN and is now also appearing regularly.

Was hanging on a "no columns to parse error"

AS Austin Storms <+19853776257> 4/24/2019, 10:13 PM
Is GP aware of what I'm trying to do with LMP feeds?

BH Ben Hakes <+19522203642> 4/24/2019, 10:15 PM
No - definitely not to the extent you're working with them now

AS Austin Storms <+19853776257> 4/24/2019, 10:15 PM
Okay. Just trying to figure out how to frame this email hahaha

BH Ben Hakes <+19522203642> 4/24/2019, 10:16 PM
Sounds good - I can help provide further context in a follow up if necessary

BH Ben Hakes <+19522203642> 4/24/2019, 10:17 PM
<https://api.misoenergy.org/MISORTWD/Impcontourmap.html>

*File "a9cca7d5-8c22-424b-9bcc-be28d282730d.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/aa/10/1D8668B0-5563-4C7E-AAB5-A4D788CB0074/69BE4911-4980-4714-8AB4-C7FE6B278468.pluginPayloadAttachment (85 KB)*

BH Ben Hakes <+19522203642> 4/24/2019, 10:17 PM
Didn't know MISO had this ^

BH Ben Hakes <+19522203642> 4/24/2019, 10:19 PM
You've been pulling data from

BH Ben Hakes <+19522203642> 4/24/2019, 10:19 PM
<https://marketplace.spp.org>

*File "91ab2c5f-9837-4080-86c7-6e715b07cd20.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/99/09/C32ACD91-4CED-4580-B322-2696E0DD410D/4A63D3C3-C32C-41C9-9DDB-F2D14D0F059B.pluginPayloadAttachment (14 KB)*

BH Ben Hakes <+19522203642> 4/24/2019, 10:19 PM
Right?

AS Austin Storms <+19853776257> 4/24/2019, 10:20 PM
Yes - they have web UI or FTP for RTMB LMP

AS Austin Storms <+19853776257> 4/24/2019, 10:20 PM
The web UI has the CSV I've been requesting via the requests module

AS Austin Storms <+19853776257> 4/24/2019, 10:21 PM
Not sure how to hit the data point to query the FTP server yet - just found it like 20 mins ago

AS Austin Storms <+19853776257> 4/24/2019, 10:21 PM
MISO is nice - full JSON

BH Ben Hakes <+19522203642> 4/24/2019, 10:22 PM
hmm

BH Ben Hakes <+19522203642> 4/24/2019, 10:58 PM
Somewhat high level thought here but, I wonder if the Total Addressable Market of Load as a Service is basically the Congestion Component + Marginal Loss Component over all the nodes on the grid

BH Ben Hakes <+19522203642> 4/24/2019, 10:58 PM
<https://www.pjm.com/-/media/training/nerc-certifications/markets-exam-materials/mkt-optimization-wkshp/location-marginal-pricing-components.ashx?la=en>

AS Austin Storms <+19853776257> 4/24/2019, 11:18 PM
Liked "Somewhat high level thought here but, I wonder if the Total Addressable Market of Load as a Service is basically the Congestion Component + Marginal Loss Component over all the nodes on the grid"

AS Austin Storms <+19853776257> 4/24/2019, 11:19 PM

Absolutely. We can provably determine the TAM of LaaS from that public marketplace data.

AS Austin Storms <+19853776257> 4/24/2019, 11:22 PM
And I think I figured out why my script was killing - I was running both models simultaneously (Antminer S9s and new gen) and they were both calling the same LMP_csv_import.py file drop then insert to the same Imp_data database table *within a sec of each other*

AS Austin Storms <+19853776257> 4/24/2019, 11:23 PM
Basically, the first one was inserting the records from the downloaded .csv and then running logic to model data tables while the second one was dropping the table that the first one was still using for model INSERT.

BH Ben Hakes <+19522203642> 4/25/2019, 9:02 AM
Liked "And I think I figured out why my script was killing - I was running both models simultaneously (Antminer S9s and new gen) and they were both calling the same LMP_csv_import.py file drop then insert to the same Imp_data database table *within a sec of each other*"

BH Ben Hakes <+19522203642> 4/25/2019, 9:02 AM
Liked "Basically, the first one was inserting the records from the downloaded .csv and then running logic to model data tables while the second one was dropping the table that the first one was still using for model INSERT."

AS Austin Storms <+19853776257> 4/25/2019, 9:59 AM
Just sent you an email with the CSV export from sql table. It ran all night - I'm going to leave it running for the next week or so.

AS Austin Storms <+19853776257> 4/25/2019, 5:21 PM
<https://www.coindesk.com/bitfinex-ny-prosecutors-tether-850-million-allege>

File "7c343e5c-214a-450b-8e76-d9fa8e90417b.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/b8/08/2E2C4C14-F10B-4925-AA06-3C3EECE9CB5E/57300EDD-1051-4048-B001-B8E76D15E94A.pluginPayloadAttachment (18 KB)

File "64e5d5db-fb2e-414a-b929-112bc92c50d0.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/68/08/98A83A53-9434-475D-9C68-4DA9D7966312/A6D770F9-873E-44F9-B67E-42AA5D1D088D.pluginPayloadAttachment (2 MB)

AS Austin Storms <+19853776257> 4/25/2019, 5:21 PM
Not bueno

BH Ben Hakes <+19522203642> 4/25/2019, 5:54 PM
Ugh yikes

BH Ben Hakes <+19522203642> 4/26/2019, 5:03 PM
Upgraded my biz card game - thought you'd appreciate this one.

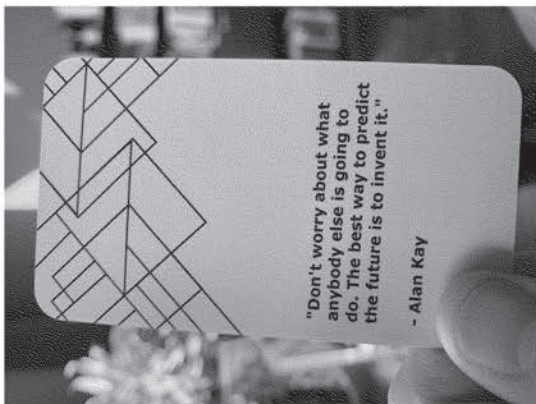


Image: ~/Library/SMS/Attachments/74/04/9954ECAB-DCE7-402C-B3E1-5C9E885523C7/57800828145__B4D33DA6-

6013-47FA-A834-40E1226E13EE.jpeg (4 MB)

AS Austin Storms <+19853776257> 4/26/2019, 5:04 PM
That's excellent

AS Austin Storms <+19853776257> 4/26/2019, 5:06 PM
I just figured out how to get all of the data in Denis' email without have portal credentials and fetching from the marketplace FTP server.

Working on integrating with my bitcoin full node to fetch blocks on loop and calculating estimate hashrate locally rather than relying on API data.

Building the future.

BH Ben Hakes <+19522203642> 4/26/2019, 5:06 PM
Laughed at "I just figured out how to get all of the data in Denis' email without have portal credentials and fetching from the marketplace FTP server.

Working on integrating with my bitcoin full node to fetch blocks on loop and calculating estimate hashrate locally rather than relying on API data.

Building the future.
"

AS Austin Storms <+19853776257> 4/26/2019, 5:06 PM
How's Lambda going? How much longer until you grad?

BH Ben Hakes <+19522203642> 4/26/2019, 5:06 PM
That's awesome - you'll have to tell me about that workaround

AS Austin Storms <+19853776257> 4/26/2019, 5:08 PM
It's all available in CSVs, you just have to format string value in the url request to increment with the calendar for the day ahead market LMP - which is currently at \$4/MWH 🤔

BH Ben Hakes <+19522203642> 4/26/2019, 5:09 PM
Laughed at "It's all available in CSVs, you just have to format string value in the url request to increment with the calendar for the day ahead market LMP - which is currently at \$4/MWH 🤔"

BH Ben Hakes <+19522203642> 4/26/2019, 5:09 PM
\$\$\$\$

AS Austin Storms <+19853776257> 4/26/2019, 5:09 PM
And I figured out breakeven calcs last night - easy to integrate that logic as well once I have the local estimated hashrate

*File "b92ee952-02ab-4c2c-b018-f6bd213049e2.HEIC" is missing.
Attachment: ~/Library/SMS/Attachments/cb/11/05861ECF-1D51-4754-9F9E-73DA9681E1DD/IMG_1453.HEIC (1 MB)*

BH Ben Hakes <+19522203642> 4/26/2019, 5:09 PM
That's amazing

BH Ben Hakes <+19522203642> 4/26/2019, 5:10 PM
I'm just gonna reorder those biz cards for you and slap a bear box logo on it

BH Ben Hakes <+19522203642> 4/26/2019, 5:10 PM
Lol so cool

AS Austin Storms <+19853776257> 4/26/2019, 5:10 PM
Laughed at "I'm just gonna reorder those biz cards for you and slap a bear box logo on it"

AS Austin Storms <+19853776257> 4/26/2019, 5:10 PM
Do itttttt

AS Austin Storms <+19853776257> 4/26/2019, 5:10 PM
BearBox trademark application is actually being opposed right now by the university of Montana - they just filed an extension to oppose, which is super weird.

BH Ben Hakes <+19522203642> 4/26/2019, 5:11 PM
"Bitcoin will ultimately be calculated based on the kWh"

AS Austin Storms <+19853776257> 4/26/2019, 5:11 PM
Loved ""Bitcoin will ultimately be calculated based on the kWh""

AS Austin Storms <+19853776257> 4/26/2019, 5:11 PM
100%

BH Ben Hakes <+19522203642> 4/26/2019, 5:12 PM
*Calculated and priced

AS Austin Storms <+19853776257> 4/26/2019, 5:13 PM
Bitcoin doesn't know what dollars are, only hashes, and the machines only know watts.

USD is external to the system.

BH Ben Hakes <+19522203642> 4/26/2019, 5:14 PM
That we don't think about money like a technology that can be improved, refined is very under appreciated

BH Ben Hakes <+19522203642> 4/26/2019, 5:16 PM
Bitcoin is much closer to a pure unit like the centimeter, kg, watt, than dollars

BH Ben Hakes <+19522203642> 4/26/2019, 5:16 PM
Peeps just don't think about it like this

AS Austin Storms <+19853776257> 4/26/2019, 5:17 PM
Because it *can't* be manipulated and 1 BTC is always 1 BTC.

AS Austin Storms <+19853776257> 4/26/2019, 5:17 PM
That's why inflation narratives are hot garbage.

BH Ben Hakes <+19522203642> 4/26/2019, 5:22 PM
Loved "That's why inflation narratives are hot garbage. "

BH Ben Hakes <+19522203642> 4/26/2019, 5:23 PM
MMTs à crack-pipe phenomenon

BH Ben Hakes <+19522203642> 4/26/2019, 5:24 PM
Oh ya and officially done with lambda by the 4th of July

AS Austin Storms <+19853776257> 4/26/2019, 5:24 PM
The economists are simply out of options.

The old ones are dying and the young ones realized they've inherited a system that's too broken to fix.

AS Austin Storms <+19853776257> 4/26/2019, 5:25 PM
Loved "Oh ya and officially done with lambda by the 4th of July"

AS Austin Storms <+19853776257> 4/26/2019, 5:25 PM
INDEPENDENCE DAY LFG

BH Ben Hakes <+19522203642> 4/26/2019, 5:25 PM
LFGGG

AS Austin Storms <+19853776257> 4/26/2019, 5:26 PM
Where do you want to work?

BH Ben Hakes <+19522203642> 4/26/2019, 5:26 PM



Image: ~/Library/SMS/Attachments/51/01/EA5FE66B-BB75-4D66-80C9-D17D417DAA74/ms-Gvil3S.gif (466 KB)

AS Austin Storms <+19853776257> 4/26/2019, 5:26 PM
Tom Brady is my Fortnite skin when I'm really bored and I login to crush 10 year olds.

BH Ben Hakes <+19522203642> 4/26/2019, 5:26 PM
Lol

AS Austin Storms <+19853776257> 4/26/2019, 5:27 PM
I'm going to finish this software and let's raise a round to buy underutilized generation assets and arb out BTC.

BH Ben Hakes <+19522203642> 4/26/2019, 5:28 PM
Work wise: as small of a shop as possible.

BH Ben Hakes <+19522203642> 4/26/2019, 5:28 PM
Loved "I'm going to finish this software and let's raise a round to buy underutilized generation assets and arb out BTC."

BH Ben Hakes <+19522203642> 4/26/2019, 5:28 PM
LFG man

AS Austin Storms <+19853776257> 4/26/2019, 5:29 PM
I'm 100% about it

BH Ben Hakes <+19522203642> 4/26/2019, 5:29 PM



Image: ~/Library/SMS/Attachments/01/01/ED6A9981-EA6A-4330-A623-98312461DBA2/ms-CG445E.gif (89 KB)

AS Austin Storms <+19853776257> 4/26/2019, 5:31 PM
Tbh, if I get this model correct it's going to be *wild*

AS Austin Storms <+19853776257> 4/26/2019, 5:31 PM
I don't know of anybody else in bitcoin who's doing anything like this from the LaaS perspective

BH Ben Hakes <+19522203642> 4/26/2019, 5:31 PM
It's so cool man. I just can't get over the fact you're real time pricing grid nodes.

AS Austin Storms <+19853776257> 4/26/2019, 5:32 PM
It's really not that complicated - I imagine most people aren't aware this problem even exists.

AS Austin Storms <+19853776257> 4/26/2019, 5:33 PM
And the people who are aware have no idea about bitcoin hahahaha

BH Ben Hakes <+19522203642> 4/26/2019, 5:33 PM
I wonder if juxtaposing BearBox vs. batteries would be an interesting marketing/sales angle

BH Ben Hakes <+19522203642> 4/26/2019, 5:34 PM
Like like look at who's buying batteries in significant quantities and why

AS Austin Storms <+19853776257> 4/26/2019, 5:35 PM
Like why use batteries when you can store the electricity in a global, highly-liquid digital asset? 🤔

BH Ben Hakes <+19522203642> 4/26/2019, 5:36 PM
It'd be good to compare BearBox on cost per installed mega watt perspective

AS Austin Storms <+19853776257> 4/26/2019, 5:36 PM
I think big players will want to hedge volatility by selling BTC mined IRT + x% = what revenue would've been at LMP pricing... and hold some as inventory.

AS Austin Storms <+19853776257> 4/26/2019, 5:36 PM
Emphasized "It'd be good to compare BearBox on cost per installed mega watt perspective "

BH Ben Hakes <+19522203642> 4/26/2019, 5:36 PM
Similar to the way batteries are priced I pretty certain

AS Austin Storms <+19853776257> 4/26/2019, 5:37 PM
I didn't even think of that.

BH Ben Hakes <+19522203642> 4/26/2019, 5:38 PM
Ya I think it's like a \$mil for a MW battery, at least, and that's just moving time around

AS Austin Storms <+19853776257> 4/26/2019, 5:38 PM
^ exactly

AS Austin Storms <+19853776257> 4/26/2019, 5:38 PM
And when batteries are full but LMP price is still negative, what happens?

AS Austin Storms <+19853776257> 4/26/2019, 5:40 PM
Idk how batteries would work from an electrical perspective - I guess they have high voltage ones that can charge off of a 13.2KV bus?

BH Ben Hakes <+19522203642> 4/26/2019, 6:10 PM
Me either but I know that there's something called a "c-rate" which normalizes the batteries discharge against its capacity

BH Ben Hakes <+19522203642> 4/26/2019, 6:11 PM
A 1 MWh, 1 C bat can discharge a MW for an hour.

BH Ben Hakes <+19522203642> 4/26/2019, 6:12 PM
"High C-rate" batteries can be incredibly expensive

BH Ben Hakes <+19522203642> 4/26/2019, 6:12 PM
http://web.mit.edu/evt/summary_battery_specifications.pdf

AS Austin Storms <+19853776257> 4/26/2019, 9:13 PM
I'll check them out.

AS Austin Storms <+19853776257> 4/26/2019, 9:13 PM
I fell asleep earlier - do you run a bitcoin full node?

BH Ben Hakes <+19522203642> 4/26/2019, 10:04 PM
Had one running on an Intel NUC after of got to MN but since got a little paranoid about leaking too much IP info so I've shelved it for now

AS Austin Storms <+19853776257> 4/26/2019, 10:05 PM
Liked "Had one running on an Intel NUC after of got to MN but since got a little paranoid about leaking too much IP info so I've shelved it for now"

AS Austin Storms <+19853776257> 4/26/2019, 10:06 PM
Yea I wish the core implementation had Tor by default tbh

AS Austin Storms <+19853776257> 4/26/2019, 10:06 PM
But messes with propagation times tmk

AS Austin Storms <+19853776257> 4/27/2019, 3:40 PM
You have a github username?

BH Ben Hakes <+19522203642> 4/27/2019, 3:41 PM
Bhakes

AS Austin Storms <+19853776257> 4/27/2019, 3:41 PM
Just sent you an invite to a private repo

AS Austin Storms <+19853776257> 4/27/2019, 3:45 PM
Dumped the local block height/ propagation script in there, gonna start moving some stuff over to it that I thought you might be interested in.

BH Ben Hakes <+19522203642> 4/28/2019, 1:18 PM
Sweet - will definitely check this out today

AS Austin Storms <+19853776257> 4/28/2019, 1:20 PM
Excellent. The propagation calcs were wrong(?) evidently, so I edited them out for the time being.
Getting with Felix Weis to figure out how it should exactly work.

AS Austin Storms <+19853776257> 4/29/2019, 9:28 AM

File "0e3e09f0-d7dd-439e-88eb-476f751931ee.HEIC" is missing.
Attachment: ~/Library/SMS/Attachments/fe/14/C5D16809-A1A5-42EB-90F9-49E696558ECD/IMG_1489.HEIC (3 MB)

AS Austin Storms <+19853776257> 4/29/2019, 9:29 AM

It's done. Logging all data now (S9 and new gen sets) and running logic control in real time on a miner in my apartment.

AS Austin Storms <+19853776257>

4/29/2019, 9:29 AM



Image: ~/Library/SMS/Attachments/10/00/A69B6F36-13C4-4B06-9254-74AC59C9F2CB/57824098684__859EA2F7-67C3-47BD-ACD4-F61EB4E87EB5.JPG (2 MB)

BH Ben Hakes <+19522203642>

4/29/2019, 10:00 PM

Laughed at an image

BH Ben Hakes <+19522203642>

4/29/2019, 10:00 PM

Liked "It's done. Logging all data now (S9 and new gen sets) and running logic control in real time on a miner in my apartment."

BH Ben Hakes <+19522203642>

4/29/2019, 10:00 PM

How are the test running?

BH Ben Hakes <+19522203642>

4/29/2019, 10:01 PM

Actually had to get my python environment up to 3.7.3 for Lambda today

AS Austin Storms <+19853776257>

4/29/2019, 10:02 PM

It's excellent - saw my first RT LMP spike earlier today and just had a few when I got home.

Can send you the data if you want to take a look.

BH Ben Hakes <+19522203642>

4/29/2019, 10:02 PM

Ya that'd be sweet

BH Ben Hakes <+19522203642>

4/29/2019, 10:03 PM

How much did she spike to?

BH Ben Hakes <+19522203642>

4/29/2019, 10:03 PM

\$/kWh?

AS Austin Storms <+19853776257>

4/29/2019, 10:03 PM

The first was around .085/kWh

AS Austin Storms <+19853776257>

4/29/2019, 10:05 PM

The last few were between ~.32/kWh and .825/kWh

AS Austin Storms <+19853776257>

4/29/2019, 10:14 PM

Miner kicked off the entire time - got the slushpool update, but had an error in one of my email functions that kicks the alert that they turned off bc I forgot to pass a param to it.

BH Ben Hakes <+19522203642> 4/29/2019, 10:16 PM
0.32 correct?

AS Austin Storms <+19853776257> 4/29/2019, 10:16 PM
Yea - \$320/MWH lol

BH Ben Hakes <+19522203642> 4/29/2019, 10:16 PM
\$0.32-0.825 /kWh

BH Ben Hakes <+19522203642> 4/29/2019, 10:16 PM
Lol okay i was gonna say crap

BH Ben Hakes <+19522203642> 4/29/2019, 10:17 PM
Loved "Miner kicked off the entire time - got the slushpool update, but had an error in one of my email functions that kicks the alert that they turned off bc I forgot to pass a param to it."

AS Austin Storms <+19853776257> 4/29/2019, 10:17 PM
That's a huge spike - LMP data for the past two days has been in the \$15-20/MWH range

AS Austin Storms <+19853776257> 4/29/2019, 10:17 PM
BTC mining breakeven for S9 gen miners is around \$80/MWH

BH Ben Hakes <+19522203642> 4/29/2019, 10:17 PM
That's cool man - so obvi this is running based off of the node in the Texas panhandle?

AS Austin Storms <+19853776257> 4/29/2019, 10:18 PM
Yes

BH Ben Hakes <+19522203642> 4/29/2019, 10:18 PM
How long are the spikes lasting?

AS Austin Storms <+19853776257> 4/29/2019, 10:19 PM
The first one was \$85/MWh for a single 5 min increment, then it dropped under the breakeven for 10 mins and went to \$107/MWh for a 5 min increment

AS Austin Storms <+19853776257> 4/29/2019, 10:20 PM
The second one went from \$325/MWH, up to \$825/MWH, and then in the \$400-670 range and last for 30 minutes straight

AS Austin Storms <+19853776257> 4/29/2019, 10:21 PM

| | | | | | |
|-----|------------------|-----------|-----------|-----------|---------|
| 226 | 4/29/19 8:18 PM | 0.0139198 | 0.0208206 | 0.0781177 | 5157.2 |
| 227 | 4/29/19 8:23 PM | 0.0139198 | 0.0208206 | 0.0781177 | 5157.2 |
| 228 | 4/29/19 8:28 PM | 0.0139198 | 0.0208206 | 0.0781176 | 5157.2 |
| 229 | 4/29/19 8:33 PM | 0.0139198 | 0.0208206 | 0.0780806 | 5154.8 |
| 230 | 4/29/19 8:38 PM | 0.0139198 | 0.0208206 | 0.0780046 | 5149.3 |
| 231 | 4/29/19 8:43 PM | 0.0139198 | 0.0208206 | 0.0780744 | 5154.4 |
| 232 | 4/29/19 8:48 PM | 0.0139198 | 0.0208206 | 0.0801312 | 5157.9 |
| 233 | 4/29/19 8:53 PM | 0.0139198 | 0.0208206 | 0.0801622 | 5159.9 |
| 234 | 4/29/19 8:58 PM | 0.0139198 | 0.3254765 | 0.0801285 | 5157.8 |
| 235 | 4/29/19 9:04 PM | 0.0139198 | 0.8259831 | 0.0801534 | 5159.4 |
| 236 | 4/29/19 9:09 PM | 0.0139198 | 0.4745788 | 0.0801117 | 5156.7 |
| 237 | 4/29/19 9:14 PM | 0.0139198 | 0.4323927 | 0.0801232 | 5157.4 |
| 238 | 4/29/19 9:19 PM | 0.0139198 | 0.4236213 | 0.0801005 | 5156.0 |
| 239 | 4/29/19 9:24 PM | 0.0139198 | 0.6686788 | 0.0817661 | 5153.3 |
| 240 | 4/29/19 9:26 PM | 0.0196624 | 0.0399367 | 0.0817296 | 5150.8 |
| 241 | 4/29/19 9:31 PM | 0.0196624 | 0.0211285 | 0.0817483 | 5152.0 |
| 242 | 4/29/19 9:34 PM | 0.0196624 | 0.0211285 | 0.0823163 | 5154.1 |
| 243 | 4/29/19 9:39 PM | 0.0196624 | 0.0210795 | 0.0823743 | 5157.74 |
| 244 | 4/29/19 9:44 PM | 0.0196624 | 0.0201802 | 0.0829787 | 5157.99 |
| 245 | 4/29/19 9:49 PM | 0.0196624 | 0.0246382 | 0.0826031 | 5155.72 |
| 246 | 4/29/19 9:54 PM | 0.0196624 | 0.0202517 | 0.082802 | 5157.99 |
| 247 | 4/29/19 10:00 PM | 0.0196624 | 0.0194325 | 0.0805216 | 5156.27 |
| 248 | 4/29/19 10:05 PM | 0.0196624 | 0.0189604 | 0.0805013 | 5154.97 |

Image: ~\Library\SMS\Attachments\3c\12\C0FA73B2-99EE-43B7-BAF7-2CFDBE1ED7B7\57828725805__5B2585EF-511D-43A9-AFFC-5E148F711517.JPG (7 MB)

AS Austin Storms <+19853776257> 4/29/2019, 10:21 PM
Day ahead LMP, then real time LMP, then breakeven mining \$/kWh

AS Austin Storms <+19853776257> 4/30/2019, 10:11 AM
Going to Boston this weekend for the mining summit at Fidelity - should be interesting to see what everyone's actually doing.
Gonna poke around and figure out if anyone else is doing what we're working on.

BH Ben Hakes <+19522203642> 4/30/2019, 10:16 AM
Loved "The second one went from \$325/MWH, up to \$825/MWH, and then in the \$400-670 range and last for 30 minutes straight"

BH Ben Hakes <+19522203642> 4/30/2019, 10:16 AM
The 5 mins spikes are tough but the 30 min is long enough to stop mining for sure

BH Ben Hakes <+19522203642> 4/30/2019, 10:17 AM
Loved "Going to Boston this weekend for the mining summit at Fidelity - should be interesting to see what everyone's actually doing.
Gonna poke around and figure out if anyone else is doing what we're working on."

BH Ben Hakes <+19522203642> 4/30/2019, 10:17 AM
That's awesome. Haha can you periscope me into that? Maybe I should make a quick trip to visit my in-laws

AS Austin Storms <+19853776257> 4/30/2019, 10:19 AM
Flights are super cheap - I literally just booked it.

BH Ben Hakes <+19522203642> 4/30/2019, 10:19 AM
(technically not "in laws" yet but)

AS Austin Storms <+19853776257> 4/30/2019, 10:19 AM
Laughed at "(technically not "in laws" yet but)"

AS Austin Storms <+19853776257> 4/30/2019, 10:19 AM
Time is a flat circle.

BH Ben Hakes <+19522203642> 4/30/2019, 10:19 AM
It's a process

BH Ben Hakes <+19522203642> 4/30/2019, 10:19 AM
Laughed at "Time is a flat circle."

AS Austin Storms <+19853776257> 4/30/2019, 10:21 AM
Does her dad own BTC yet?

BH Ben Hakes <+19522203642> 4/30/2019, 10:22 AM
haha - I gave him some one time when he drove us to the airport... that was at \$9k

AS Austin Storms <+19853776257> 4/30/2019, 10:22 AM
Hahahahahahaha

BH Ben Hakes <+19522203642> 4/30/2019, 10:23 AM
He's a Mass District Attorney - safe to say he's skeptical but I'm workin on him

AS Austin Storms <+19853776257> 4/30/2019, 10:23 AM
I gave my brother one for his wedding @ \$5k and told him to HODL through the \$20k spike.

He was not happy w me.

AS Austin Storms <+19853776257> 4/30/2019, 10:23 AM
Liked "He's a Mass District Attorney - safe to say he's skeptical but I'm workin on him"

BH Ben Hakes <+19522203642> 4/30/2019, 11:07 AM
Laughed at "I gave my brother one for his wedding @ \$5k and told him to HODL through the \$20k spike.
He was not happy w me."

AS Austin Storms <+19853776257> 5/1/2019, 12:24 PM
When can you review some of this data and the code with me? Want to move fast with GP and either sell the IP to them, another entity that's generating, or work to raise a round.

BH Ben Hakes <+19522203642> 5/1/2019, 1:33 PM
Can you talk tomorrow morning? Maybe around 9am central?

BH Ben Hakes <+19522203642> 5/1/2019, 1:33 PM
I'd like to follow up with GP as well

AS Austin Storms <+19853776257> 5/1/2019, 2:01 PM
I've got a 8am flight to Boston, but land there at 3pm. Can do after that or very early Friday morning.

BH Ben Hakes <+19522203642> 5/1/2019, 3:02 PM
Let's talk now - call me when you can

AS Austin Storms <+19853776257> 5/1/2019, 3:03 PM
Gimme about 30-45 mins

AS Austin Storms <+19853776257> 5/1/2019, 3:03 PM
Walking in to visit my grandma with Alzheimer's

BH Ben Hakes <+19522203642> 5/1/2019, 3:03 PM
okay - I've got a 4 pm central, I could also talk at 5pm central

BH Ben Hakes <+19522203642> 5/1/2019, 3:04 PM
that's tough - my Grandma passed away with Alzheimers a couple of years ago

BH Ben Hakes <+19522203642> 5/1/2019, 3:04 PM
talk to you after

AS Austin Storms <+19853776257> 5/1/2019, 3:08 PM
Yessir I'll call you at 5

AS Austin Storms <+19853776257> 5/1/2019, 4:55 PM
Stuck in traffic, gimme 15

BH Ben Hakes <+19522203642> 5/1/2019, 4:56 PM
no problem - I'm free until 6:15

AS Austin Storms <+19853776257> 5/1/2019, 4:56 PM
Sweet

AS Austin Storms <+19853776257> 5/1/2019, 9:15 PM
I found the projects GP purchased - building the models now

AS Austin Storms <+19853776257> 5/2/2019, 6:54 AM

Exelon4-11 and HPW1

BH Ben Hakes <+19522203642> 5/2/2019, 8:21 AM
Noice

BH Ben Hakes <+19522203642> 5/2/2019, 9:00 AM
<https://twitter.com/zerohedge/status/1123947753904775169?s=21>

*File "5979e00e-8278-4d3f-bc16-b1a1aad6e129.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/70/00/E8D35CDB-1C73-4EEC-9195-A3D3FBACED96/4C174D1F-EE39-47C4-AEDF-0C118156D94D.pluginPayloadAttachment (22 KB)*

BH Ben Hakes <+19522203642> 5/2/2019, 9:01 AM
^^Jeeze

BH Ben Hakes <+19522203642> 5/2/2019, 9:26 AM
Noice

BH Ben Hakes <+19522203642> 5/2/2019, 9:26 AM
^^Jeeze

AS Austin Storms <+19853776257> 5/2/2019, 9:32 AM
I'll be on the first plane out of the states when MMT gains significant political traction.

BH Ben Hakes <+19522203642> 5/2/2019, 9:35 AM
IMO a "flirt" with MMT-ism is inevitable.

BH Ben Hakes <+19522203642> 5/2/2019, 9:36 AM
Some might also call it "hyperbitcoinization"

AS Austin Storms <+19853776257> 5/2/2019, 10:06 AM
It'll happen. And I'll be sitting on a beach in South America with my laptop and my seed phrase tattooed to the bottom of my foot.

BH Ben Hakes <+19522203642> 5/2/2019, 10:07 AM
lol

BH Ben Hakes <+19522203642> 5/2/2019, 10:07 AM
seed phrase tattoo?

BH Ben Hakes <+19522203642> 5/2/2019, 10:07 AM
bad opsec, no?

BH Ben Hakes <+19522203642> 5/2/2019, 10:08 AM
opsec

AS Austin Storms <+19853776257> 5/2/2019, 10:09 AM
Yea, you just memorized random ones and add a password via BIP39

AS Austin Storms <+19853776257> 5/2/2019, 10:09 AM
Like tattoo every other word, remember the 6 in between, and add your own password at the end.

AS Austin Storms <+19853776257> 5/2/2019, 10:10 AM
Otherwise, you get hit over the head and your bitcoin is lost in your memory forever.

3rd world countries are strange places for storage and seizures, best to one-use hardware wallets, recover, and destroy.

AS Austin Storms <+19853776257> 5/2/2019, 10:37 AM
Just emailed you over some of the EXELON data from the different sites - found the FERC approval request for the sale in Feb '19 to identify which assets they had purchased, the EXELON Wind 4 facility is 79.8MW

BH Ben Hakes <+19522203642> 5/2/2019, 10:41 AM
Cool - I'll take a look

AS Austin Storms <+19853776257> 5/2/2019, 11:22 AM
I think the model might break around midnight because of how the date time parses to build the csv url - I tried to fix it last night, but ran out of time.

Either way, it's now pulling the hourly DA LMP prices from the large csv (there are 24,000 entries because each of the 1,000 locations has 24 hours of DA LMP rates) and still utilizing RTBM LMP for the other.

AS Austin Storms <+19853776257> 5/3/2019, 8:50 AM
Just sat finished breakfast with Steve Barbour and his fiancé - very sharp dude.

BH Ben Hakes <+19522203642> 5/3/2019, 8:52 AM
That's awesome - you guys probably have a few things to talk about lol

BH Ben Hakes <+19522203642> 5/3/2019, 8:53 AM
I'd be interested to do some data crunching Sunday/Monday.

BH Ben Hakes <+19522203642> 5/3/2019, 8:54 AM
(Possibly tomorrow AM but not sure if you'll be traveling)

BH Ben Hakes <+19522203642> 5/3/2019, 8:55 AM
Thinking of building a lookup table for "node mining profitability"

AS Austin Storms <+19853776257> 5/3/2019, 9:03 AM
Can do tmrw morning, I fly out Sunday.

BH Ben Hakes <+19522203642> 5/3/2019, 9:04 AM
Cool - probably something around noon your time. Curious to hear how the conference was

AS Austin Storms <+19853776257> 5/3/2019, 1:48 PM
Man this summit is excellent, hope they make the recordings available for the public.

AS Austin Storms <+19853776257> 5/3/2019, 4:21 PM
Just linked up with Whatsminer Sales VP.

Can fly to China and bypass import fees for miners by shipping to Germany then to States.

BH Ben Hakes <+19522203642> 5/5/2019, 10:54 AM
A bitcoiner friend of mine sent me this. Good reads on MMT as describing the current state of central banking.

Two articles on MMT from a trader's point of view:
- <https://www.themacrotourist.com/posts/2019/04/23/mmt1/>
- <https://www.themacrotourist.com/posts/2019/04/24/mmt2/>

AS Austin Storms <+19853776257> 5/5/2019, 6:49 PM
Liked "A bitcoiner friend of mine sent me this. Good reads on MMT as describing the current state of central banking.

Two articles on MMT from a trader's point of view:
- <https://www.themacrotourist.com/posts/2019/04/23/mmt1/>
- <https://www.themacrotourist.com/posts/2019/04/24/mmt2/>

AS Austin Storms <+19853776257> 5/6/2019, 11:02 AM
Interesting read.

BH Ben Hakes <+19522203642> 5/6/2019, 11:03 AM
It's interesting to think about the consequent

AS Austin Storms <+19853776257> 5/6/2019, 11:03 AM
Long tail consequence are a bitch when playing with economic theory

BH Ben Hakes <+19522203642> 5/6/2019, 11:03 AM
consequences of the fed just "cancelling" the debt it holds on the fed gov't

BH Ben Hakes <+19522203642> 5/6/2019, 11:04 AM
I hadn't thought about it in the way the article describes it

BH Ben Hakes <+19522203642> 5/6/2019, 11:05 AM
Ultimately I think MMT -underestimates the risks that you put yourself in a inflation/hyper inflation scenario

AS Austin Storms <+19853776257> 5/6/2019, 11:05 AM
The Japanese section is the most interesting to me - I've had very at length convos with Terrance Yang about this

AS Austin Storms <+19853776257> 5/6/2019, 11:07 AM
I think MMT doesn't barely *recognize* that risk. Internal Econ is so different than global, macro Econ.

Better have a lot of economic production in-house or your currency relative purchasing power gets slaughtered

BH Ben Hakes <+19522203642> 5/6/2019, 11:07 AM
Also the trader ends up recommending holding fixed assets... but doesn't mention Bitcoin

BH Ben Hakes <+19522203642> 5/6/2019, 11:08 AM
Sad! for him

AS Austin Storms <+19853776257> 5/6/2019, 11:08 AM
Have to hold global fixed assets to offset your currency's purchasing power getting slashed globally - why do you think gold has been in heavy accumulation for the past 10 years especially?

AS Austin Storms <+19853776257> 5/6/2019, 11:09 AM
On a separate note, I just converted over from SQLite3 local database to PostgreSQL and this shit is beautiful.

BH Ben Hakes <+19522203642> 5/6/2019, 11:11 AM
Liked "Have to hold global fixed assets to offset your currency's purchasing power getting slashed globally - why do you think gold has been in heavy accumulation for the past 10 years especially?"

AS Austin Storms <+19853776257> 5/6/2019, 11:11 AM
^ for all of the mining data mapping.

There are people doing what we're trying to do in ERCOT iso in TX - met a few of the big energy/CFO types in Boston this past weekend + the big NG project the Winklevoss twins just backed.

AS Austin Storms <+19853776257> 5/6/2019, 11:12 AM
<https://www.bloomberg.com/news/articles/2019-05-03/winklevosses-private-equity-eye-power-as-fix-for-u-s-gas-glut>

File "13118fff-3efb-4197-8b6d-2e0bd64f0baf.pluginPayloadAttachment" is missing.
Attachment: ~/Library/SMS/Attachments/57/07/1109AA56-9E62-4281-8ABD-377D531F34C5/535F5144-8591-4444-8283-DE5BDBEFDE76.pluginPayloadAttachment (559 bytes)

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BH Ben Hakes <+19522203642> 5/6/2019, 11:12 AM
woah

AS Austin Storms <+19853776257> 5/6/2019, 11:13 AM
lancium.com

File "2a378e7a-2364-4ef4-8b67-86e6a6223a15.pluginPayloadAttachment" is missing.

Attachment: ~/Library/SMS/Attachments/7b/11/A381505A-3EBB-4994-951C-7A3518295811/D646407C-AF31-4DB6-9696-8B2C0260CD92.pluginPayloadAttachment

AS Austin Storms <+19853776257> 5/6/2019, 11:13 AM
<https://www.linkedin.com/in/michael-mcnamara-1055211>

BH Ben Hakes <+19522203642> 5/6/2019, 11:14 AM
So Crusoe is competing with Steve Barbour

BH Ben Hakes <+19522203642> 5/6/2019, 11:14 AM
Directly...

AS Austin Storms <+19853776257> 5/6/2019, 11:15 AM
^ Yes, but Steve's model is slightly different than their's.

AS Austin Storms <+19853776257> 5/6/2019, 11:15 AM
I'm designing a fan controller PDU for him now that should be done by Wednesday.

BH Ben Hakes <+19522203642> 5/6/2019, 11:16 AM
sweet

BH Ben Hakes <+19522203642> 5/6/2019, 11:16 AM
sounds like it was a go-to conference

AS Austin Storms <+19853776257> 5/6/2019, 11:17 AM
It was. The guys at Lancium are doing what we are trying to do exactly, but they don't have a container builder or software team yet. Mike's pretty interested in my solution.

AS Austin Storms <+19853776257> 5/6/2019, 11:18 AM
Going to put the data together for all of the EXELON sites this afternoon and send to you and the GP team.

AS Austin Storms <+19853776257> 5/6/2019, 11:20 AM
I'm going to model the data from every pnode in the SPP and have it running in background as well.

BH Ben Hakes <+19522203642> 5/6/2019, 11:23 AM
This is great - I think we start putting the heat on GP

BH Ben Hakes <+19522203642> 5/6/2019, 11:24 AM
Things are obviously heating up

BH Ben Hakes <+19522203642> 5/6/2019, 11:24 AM
both with BTC and LAAS/containerized solutions

AS Austin Storms <+19853776257> 5/6/2019, 11:25 AM
Yep - and Michael McNamara wants me to ping some of my former product managers for his distributed compute service.

They thing that ML services and neural network outsourcing is going to be a 15-20x play on current windpower pricing.

BH Ben Hakes <+19522203642> 5/6/2019, 11:27 AM
woah

AS Austin Storms <+19853776257> 5/6/2019, 11:29 AM
He asked me if I was interested and I told him it'd have to be a helluva offer.

Plus they want my logic for curtailing miners on DA and RTMB LMP - all over dinner Friday night and several bottles of wine, they told me that they were looking into Digital Shovel, but their Schneider Electric/Siemens engineer was worried about 480/277v because of potential liability i.e. line to neutral voltage of 277 *kills* you if you touch it.

BH Ben Hakes <+19522203642> 5/6/2019, 11:29 AM
I didn't think NN outsourcing was profitable yet

AS Austin Storms <+19853776257> 5/6/2019, 11:29 AM
It's not yet, long term infra play.

BH Ben Hakes <+19522203642> 5/6/2019, 11:32 AM
Loved "He asked me if I was interested and I told him it'd have to be a helluva offer.

Plus they want my logic for curtailing miners on DA and RTMB LMP - all over dinner Friday night and several bottles of wine, they told me that they were looking into Digital Shovel, but their Schneider Electric/Siemens engineer was worried about 480/277v because of potential liability i.e. line to neutral voltage of 277 *kills* you if you touch it."

BH Ben Hakes <+19522203642> 5/6/2019, 11:39 AM
Do you think you could do a raise before a deal was done with a generation asset owner? Or is the critical path to a raise a signed contract for X BearBoxes?

AS Austin Storms <+19853776257> 5/6/2019, 11:44 AM
It'd be difficult to raise either way without a field tested proof of concept - but with all of the data modeled, much easier by quantifying rev and risk.

AS Austin Storms <+19853776257> 5/6/2019, 11:45 AM
There are certain business reqs that I'm simply not privy to (unknown unknowns) from the generation asset compliance side - that's Glide Paths backyard and I imagine it changes for every jurisdiction in the SPP or ERCOT iso depending on regs, capital structures, etc.

BH Ben Hakes <+19522203642> 5/6/2019, 11:46 AM
Liked "There are certain business reqs that I'm simply not privy to (unknown unknowns) from the generation asset compliance side - that's Glide Paths backyard and I imagine it changes for every jurisdiction in the SPP or ERCOT iso depending on regs, capital structures, etc."

BH Ben Hakes <+19522203642> 5/6/2019, 11:46 AM
Liked "It'd be difficult to raise either way without a field tested proof of concept - but with all of the data modeled, much easier by quantifying rev and risk."

BH Ben Hakes <+19522203642> 5/6/2019, 11:46 AM
Agreed - it's easier to sell with the data modeled

AS Austin Storms <+19853776257> 5/6/2019, 11:47 AM
I'll have the models up by the end of the day and figure out how to give remote access to provisioned users to the db for live views.

AS Austin Storms <+19853776257> 5/6/2019, 11:47 AM
This is why I switched to postgresql

BH Ben Hakes <+19522203642> 5/6/2019, 11:47 AM
Also agree that GP has institutional knowledge that is GP's specialty

BH Ben Hakes <+19522203642> 5/6/2019, 11:47 AM
Liked "This is why I switched to postgresql"

BH Ben Hakes <+19522203642> 5/6/2019, 11:48 AM
I guess I want to create some urgency for Dan/GP to give them a bit of FOMO

AS Austin Storms <+19853776257> 5/6/2019, 11:49 AM
Yea, I'll send out an email this afternoon detailing exactly what I've done, the conference, lancium team w Mike McNamara, and some of the NG projects happening now.

BH Ben Hakes <+19522203642> 5/6/2019, 11:49 AM
Great.

BH Ben Hakes <+19522203642> 5/6/2019, 11:49 AM
Send that and I think that email will eventually make it to Dan.

BH Ben Hakes <+19522203642> 5/6/2019, 11:51 AM
I'm very close to calling Dan to get his thoughts. Usually things happen faster when he gets going on ideas.

AS Austin Storms <+19853776257> 5/6/2019, 11:51 AM
The thing that's currently setting me apart from everyone else is the fully vertically integrated solution - there are plenty of hardware guys, but none are doing what I am from the software side because they don't know how.

That advantage won't last forever though.

BH Ben Hakes <+19522203642> 5/6/2019, 11:52 AM
Right.

BH Ben Hakes <+19522203642> 5/6/2019, 11:53 AM
At some point we just need to know where Dan/GP stand. I know these things are complicated and require lots of regulatory hurdles.

AS Austin Storms <+19853776257> 5/6/2019, 11:58 AM
Yep, exactly.

BH Ben Hakes <+19522203642> 5/6/2019, 12:52 PM
What was the conference called this weekend?

BH Ben Hakes <+19522203642> 5/6/2019, 12:52 PM
Mike Hoadley's GF works at Fidelity

BH Ben Hakes <+19522203642> 5/6/2019, 12:56 PM
I got it.

BH Ben Hakes <+19522203642> 5/6/2019, 12:57 PM
Just talked with MH, he said he probably would have gone to this conference. MH also said that they're getting some real estate issues cured and that closing should be 30-60 days.

AS Austin Storms <+19853776257> 5/6/2019, 4:58 PM
You have time for a 5 min chat?

BH Ben Hakes <+19522203642> 5/6/2019, 4:58 PM
yeah give me like 5 mins - i can call you if that's okay

AS Austin Storms <+19853776257> 5/6/2019, 4:58 PM
Yea np

AS Austin Storms <+19853776257> 5/10/2019, 12:42 PM
Haven't heard back from GP since last email. Nobody's selling S9s anymore - they're profitable at \$0.10/kWh lol

BH Ben Hakes <+19522203642> 5/11/2019, 8:35 AM
Yeah. I think they are all busy and that this is more of a side project and not urgent for them... that's what happened with our first attempt.

BH Ben Hakes <+19522203642> 5/11/2019, 8:36 AM
(But again Dan loves this so when Dan says to fix it they start fixing it)

BH Ben Hakes <+19522203642> 5/11/2019, 8:37 AM
The other thing, any I don't know if this is coming into play here (it came into play last time)

BH Ben Hakes <+19522203642> 5/11/2019, 8:38 AM
Is that their capital, while significant, is discretionary.

BH Ben Hakes <+19522203642> 5/11/2019, 8:38 AM
Sorry is NOT discretionary.

BH Ben Hakes <+19522203642> 5/11/2019, 8:40 AM
Basically, they have to go to their capital partner for every deal, even if it's a no brainer. In PE you ALWAYS prefer discretionary as a manager cuz then you can move really fast.

BH Ben Hakes <+19522203642> 5/11/2019, 8:41 AM
My old CEO used to give people shit cuz their capital wasn't discretionary.

BH Ben Hakes <+19522203642> 5/11/2019, 8:42 AM
Tldr - they have to bring the mining deal to their capital partner as well instead of Dan just say "go".

BH Ben Hakes <+19522203642> 5/11/2019, 8:42 AM
Dan has significant influence but that just slows things down.

BH Ben Hakes <+19522203642> 5/11/2019, 8:44 AM
Also, thoughts on this rally? 📉 short squeezeeeee

AS Austin Storms <+19853776257> 5/11/2019, 2:51 PM
That all makes sense - just going to cost them more and more the longer they wait to make the decision (assuming price stays in the upward direction).

BH Ben Hakes <+19522203642> 5/11/2019, 2:51 PM
agreed

AS Austin Storms <+19853776257> 5/11/2019, 2:52 PM
A lot of BTC moving from Bitfinex cold wallet addresses - looks like people are dumping Tether for BTC.

Not sure if the rally is a big bull trap or what. I bought a significant amount of BTC at 3,300 after selling half my stack at 18k so I'm not complaining

AS Austin Storms <+19853776257> 5/11/2019, 2:54 PM
Breakeven price to mine BTC with a S9 is between \$0.12-0.13/kWh right now lol - grid miners will come back online if they haven't capitulated already, hashrate might spike and drive profitability down and selling pressure up, price will stagnate potentially

BH Ben Hakes <+19522203642> 5/19/2019, 11:19 AM
Hey - Caught up w/ Mike Hoadley today on other stuff and I asked him about the panhandle project. He said to sit tight and that things will probably start to move a little more after their board meeting on May 30th. I asked him what course of action might be most likely right now and he said maybe buying that box of yours first, but running in parallel on a larger deal as well.

BH Ben Hakes <+19522203642> 5/19/2019, 11:22 AM
I get the impression though that cheap miners might be more difficult to come by now vs. a few months ago? I may want to temper expectations about their "entry costs", given that the price and attention have spiked in the last month.

AS Austin Storms <+19853776257> 5/19/2019, 12:16 PM
Liked "Hey - Caught up w/ Mike Hoadley today on other stuff and I asked him about the panhandle project. He said to sit tight and that things will probably start to move a little more after their board meeting on May 30th. I asked him what course of action might be most likely right now and he said maybe buying that box of yours first, but running in parallel on a larger deal as well."

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AS Austin Storms <+19853776257> 5/19/2019, 12:18 PM
That box is sold - I'll have to build them another if they want one. Might be better given that previous gen miners are *very* hard to come by in any quantity.

AS Austin Storms <+19853776257> 5/19/2019, 12:19 PM
Still modeling the data at all of the EXELON sites as well, well send over to you when I get home tonight. Was in Baltimore for Preakness all weekend.

BH Ben Hakes <+19522203642> 5/19/2019, 12:22 PM
Liked "That box is sold - I'll have to build them another if they want one. Might be better given that previous gen miners are *very* hard to come by in any quantity."

BH Ben Hakes <+19522203642> 5/19/2019, 12:22 PM
Liked "Still modeling the data at all of the EXELON sites as well, well send over to you when I get home tonight. Was in Baltimore for Preakness all weekend."

BH Ben Hakes <+19522203642> 5/19/2019, 12:22 PM
That's awesome - sounds like a blast.

AS Austin Storms <+19853776257> 5/19/2019, 12:22 PM
It was wild. Won \$21k on a straight super 😊
597:1 payout

BH Ben Hakes <+19522203642> 5/19/2019, 12:23 PM
Emphasized "It was wild. Won \$21k on a straight super 😊
597:1 payout"

BH Ben Hakes <+19522203642> 5/19/2019, 12:23 PM
🙄

BH Ben Hakes <+19522203642> 5/19/2019, 12:23 PM
😊

BH Ben Hakes <+19522203642> 5/19/2019, 12:23 PM
Okay you definitely had fun then

- AS **Austin Storms <+19853776257>** 5/19/2019, 12:25 PM
Yea it was absolutely nuts. A friend of mine had a private chalet in the infield and I'm officially spoiled for life.
How've you been? Lambda still rocking and rolling? Any interesting projects you're doing?
- BH **Ben Hakes <+19522203642>** 5/19/2019, 10:23 PM
Laughed at "Yea it was absolutely nuts. A friend of mine had a private chalet in the infield and I'm officially spoiled for life."
How've you been? Lambda still rocking and rolling? Any interesting projects you're doing?"
- BH **Ben Hakes <+19522203642>** 5/19/2019, 10:26 PM
Haha - sounds like a good friend to know.
Things are good. Still rocking on Lambda, got about 5-6 weeks left.
Working on a project doing some low level integrations with Bluetooth devices and push notifications RN. Also diving into more functional programming as well, which I'm really liking.
- AS **Austin Storms <+19853776257>** 5/29/2019, 5:41 PM
Liked "Haha - sounds like a good friend to know."
Things are good. Still rocking on Lambda, got about 5-6 weeks left.
Working on a project doing some low level integrations with Bluetooth devices and push notifications RN. Also diving into more functional programming as well, which I'm really liking."
- AS **Austin Storms <+19853776257>** 5/29/2019, 5:42 PM
Bluetooth devices and push notifications have a huge working field - there was so of that at Garmin while I was there and they were launching the vivofit and watch series.
- AS **Austin Storms <+19853776257>** 5/29/2019, 5:44 PM
I just finished the script that takes every settlement location in the SPP, fetches DA & RT LMP from CSV for each, and calculates mining profitability statistics for them - each output to its own postgresql table.
- AS **Austin Storms <+19853776257>** 5/29/2019, 5:45 PM

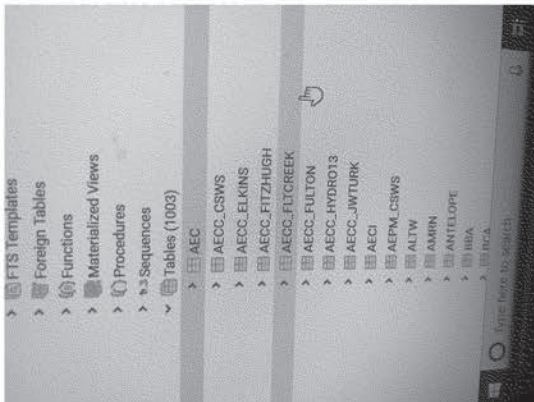


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- BH **Ben Hakes <+19522203642>** 5/29/2019, 8:46 PM
- BH **Ben Hakes <+19522203642>** 5/29/2019, 8:46 PM
That's so cool.

BH Ben Hakes <+19522203642> 5/29/2019, 8:47 PM


BH Ben Hakes <+19522203642> 5/29/2019, 8:48 PM
Would someone buy this?

AS Austin Storms <+19853776257> 5/29/2019, 8:50 PM
Not sure - I might turn it into a live site that tracks Bitcoin mining profitability of different mining machines across all sites.

AS Austin Storms <+19853776257> 6/1/2019, 7:56 PM
The guy who was going to buy my prototype container had his power delayed for 3 months and doesn't want it anymore - not sure if GlidePath is interested in it and machines still.

BH Ben Hakes <+19522203642> 6/1/2019, 9:48 PM
Liked "The guy who was going to buy my prototype container had his power delayed for 3 months and doesn't want it anymore - not sure if GlidePath is interested in it and machines still."

BH Ben Hakes <+19522203642> 6/1/2019, 9:49 PM
I'll call Dan next week

AS Austin Storms <+19853776257> 6/10/2019, 4:47 PM
<https://www.youtube.com/watch?v=YwYjfJAp-Io>

*File "bfaff8cf-0723-40d4-926c-97fb375b9bb3.pluginPayloadAttachment" is missing.
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AS Austin Storms <+19853776257> 6/10/2019, 4:47 PM
<https://www.youtube.com/watch?v=1JhvxMo8khk>

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BH Ben Hakes <+19522203642> 6/13/2019, 1:51 PM
Some people get excited about new episodes of their latest Netflix show. I get excited about watching panel talks from bitcoin mining conferences 😊

BH Ben Hakes <+19522203642> 6/13/2019, 2:52 PM
Even this intro is incredibly professional

AS Austin Storms <+19853776257> 6/13/2019, 4:30 PM
The entire summit was very well done.

BH Ben Hakes <+19522203642> 6/18/2019, 11:52 AM
Sounds like GP is finally going to close on the site in early July

AS Austin Storms <+19853776257> 6/18/2019, 11:58 AM

Which site?

BH Ben Hakes <+19522203642> 6/18/2019, 11:58 AM
"Stockyards" I guess... I think it's still the Texas one

BH Ben Hakes <+19522203642> 6/18/2019, 11:59 AM
They had to secure the land as well.

AS Austin Storms <+19853776257> 6/18/2019, 11:59 AM
Ah I see.

BH Ben Hakes <+19522203642> 6/20/2019, 3:34 PM
You still trying to offload that box?

BH Ben Hakes <+19522203642> 6/20/2019, 3:35 PM
What are the high-level specs again? Mikes wondering about ballpark costs w/ delivery.

AS Austin Storms <+19853776257> 6/20/2019, 4:02 PM
Definitely could - just buttoned it up last week. I'll put together pricing as-is (basic Raptor CryptoBeast, manual fan control) with delivery and then upgraded pricing with my custom PDUs, fan relay controller, etc. this afternoon when I get home.

High-level specs are 120/208Y, LLLG (no neutral), fed overhead with mast kit or underneath from pad mount, 1200A main, designed for ~275kW at full load of 192 machines.

Reasonably, I'd estimate 3/4 of the hashing boards are operational, so there's likely ~2PH/s @ 200kW most likely.

AS Austin Storms <+19853776257> 6/20/2019, 4:06 PM
I'm about done putting together the pitch deck on how the boxes and PDUs are designed from a hardware perspective and how the software works down to the script/database level.

Will be interesting to see who's about it next week in SF.

BH Ben Hakes <+19522203642> 6/20/2019, 4:12 PM
Liked "Definitely could - just buttoned it up last week. I'll put together pricing as-is (basic Raptor CryptoBeast, manual fan control) with delivery and then upgraded pricing with my custom PDUs, fan relay controller, etc. this afternoon when I get home.

High-level specs are 120/208Y, LLLG (no neutral), fed overhead with mast kit or underneath from pad mount, 1200A main, designed for ~275kW at full load of 192 machines.

Reasonably, I'd estimate 3/4 of the hashing boards are operational, so there's likely ~2PH/s @ 200kW most likely."

BH Ben Hakes <+19522203642> 6/20/2019, 4:12 PM
Sweet

AS Austin Storms <+19853776257> 6/20/2019, 4:14 PM
Also, sent you an email with some screenshots of the db - I've been logging data across all 1,000+ settlement locations in the SPP in 5 minute increments for a week or so.

The data is ridiculous.

BH Ben Hakes <+19522203642> 6/20/2019, 4:42 PM
That is so cool. Any patterns that you've started to see?

AS Austin Storms <+19853776257> 6/21/2019, 12:11 AM
Haven't done much analysis besides hashrate distribution - looks like +13 hours brings on a lot

AS Austin Storms <+19853776257> 6/21/2019, 1:18 PM
Unknown to me, my partner agreed to sell the Dragonmints last week to a hosting company - they texted me this

morning and are picking them up Sunday afternoon.

Feel free to tell Mike that I've got the container but no machines and I apologize for not knowing sooner.

BH Ben Hakes <+19522203642> 6/26/2019, 8:50 AM
Hey sorry I've been late to respond to this - hope the meetings in SF are going well.

Conference looks pretty good (still might have enjoyed the mining conf videos more).

AS Austin Storms <+19853776257> 6/28/2019, 5:32 PM
All good bro - just got back from SF. Wild week out there.

AS Austin Storms <+19853776257> 6/28/2019, 5:32 PM
Mining conference was better - this was more networking.

AS Austin Storms <+19853776257> 6/28/2019, 5:33 PM
About to send you CSV dumps of the past two week data comps for GP sites.

Never heard back from Mike after the last emails.

AS Austin Storms <+19853776257> 7/31/2019, 10:43 AM
Yo! You finish Lambda yet??

BH Ben Hakes <+19522203642> 7/31/2019, 11:17 AM
Yo! They asked me to TA so I've been doing that for a little bit. Still got like 4 weeks left of the curriculum but is all CS stuff. Got some interviews coming up.

You been busy?

BH Ben Hakes <+19522203642> 7/31/2019, 11:18 AM
Btw I guess GP is still kicking around mining... their just kinda slow about it.

BH Ben Hakes <+19522203642> 7/31/2019, 11:19 AM
They're

BH Ben Hakes <+19522203642> 7/31/2019, 11:20 AM
We should catch up. Also, did you end up moving?

AS Austin Storms <+19853776257> 7/31/2019, 11:24 AM
Liked "Yo! They asked me to TA so I've been doing that for a little bit. Still got like 4 weeks left of the curriculum but is all CS stuff. Got some interviews coming up.

You been busy?"

AS Austin Storms <+19853776257> 7/31/2019, 11:25 AM
Solid solid. What do you do as a TA? I've been mega busy, but just flew to Vail to take a week and reset.

AS Austin Storms <+19853776257> 7/31/2019, 11:25 AM
Haven't moved yet hahaha

BH Ben Hakes <+19522203642> 7/31/2019, 11:26 AM
Liked "Solid solid. What do you do as a TA? I've been mega busy, but just flew to Vail to take a week and reset. "

BH Ben Hakes <+19522203642> 7/31/2019, 11:26 AM
That's awesome. Get some sleep and go be in nature.

BH Ben Hakes <+19522203642> 7/31/2019, 11:27 AM
TA do technical code reviews and a spot of technical project management. Nothing too crazy.

BH Ben Hakes <+19522203642> 7/31/2019, 11:28 AM
The run to ~13k woke some people up

AS Austin Storms <+19853776257> 7/31/2019, 11:29 AM
Liked "TA do technical code reviews and a spot of technical project management. Nothing too crazy."

AS Austin Storms <+19853776257> 7/31/2019, 11:29 AM
Liked "The run to ~13k woke some people up"

BH Ben Hakes <+19522203642> 7/31/2019, 11:29 AM
I thought of you cuz the other week when the senate and house were having hearings on crypto, there was another senate/house hearing on "securing and transforming our electric grid"

AS Austin Storms <+19853776257> 7/31/2019, 11:30 AM
Yes it did - everyone who was dragging ass to build out ops is panicking right now.

A lot of ASICs on the ground still.

BH Ben Hakes <+19522203642> 7/31/2019, 11:30 AM
I thought, joke on everyone cuz those topics are the same

AS Austin Storms <+19853776257> 7/31/2019, 11:30 AM
Liked "I thought of you cuz the other week when the senate and house were having hearings on crypto, there was another senate/house hearing on "securing and transforming our electric grid""

AS Austin Storms <+19853776257> 7/31/2019, 11:30 AM
Liked "I thought, joke on everyone cuz those topics are the same"

AS Austin Storms <+19853776257> 7/31/2019, 11:30 AM
The sooner that electricity prices are denominated in BTC, the sooner we have hyperbitcoinization.

BH Ben Hakes <+19522203642> 7/31/2019, 11:31 AM
The narrative is slowly creeping into the mainstream

BH Ben Hakes <+19522203642> 7/31/2019, 11:32 AM
I've got liberal friends and conservative friends and it's funny because there's an argument for each of them

BH Ben Hakes <+19522203642> 7/31/2019, 11:34 AM
I like to poke my liberal friends recently by asking them if they support sanctions on foreign govt like Iran, made possible by USD hegemony

BH Ben Hakes <+19522203642> 7/31/2019, 11:34 AM
Or the fact that fiat allows govt to print money for war that they don't have

AS Austin Storms <+19853776257> 7/31/2019, 11:43 AM
Emphasized "I like to poke my liberal friends recently by asking them if they support sanctions on foreign govt like Iran, made possible by USD hegemony"

AS Austin Storms <+19853776257> 7/31/2019, 11:43 AM
Emphasized "Or the fact that fiat allows govt to print money for war that they don't have"

AS Austin Storms <+19853776257> 7/31/2019, 11:56 AM
Same. They don't have an answer for the Iranian OFAC sanctions.

AS Austin Storms <+19853776257> 7/31/2019, 11:57 AM
The 18 year "war" we've been in has been summarily funded by the 2001 AUMF, passed three days after 9/11.
Never ending funding to hunt terrorists all over the globe without Congress having to declare war is ridiculous.

BH Ben Hakes <+19522203642> 7/31/2019, 5:42 PM
Disliked "The 18 year "war" we've been in has been summarily funded by the 2001 AUMF, passed three days after 9/11.
Never ending funding to hunt terrorists all over the globe without Congress having to declare war is ridiculous."

BH Ben Hakes <+19522203642> 7/31/2019, 5:42 PM
absolutely nuts

BH Ben Hakes <+19522203642> 7/31/2019, 5:43 PM
happy fed funds rate cut day BTW

AS Austin Storms <+19853776257> 7/31/2019, 5:46 PM
LMFAO same to you

AS Austin Storms <+19853776257> 7/31/2019, 5:46 PM
#BuyBitcoin

BH Ben Hakes <+19522203642> 7/31/2019, 6:00 PM
#minebitcoin

AS Austin Storms <+19853776257> 7/31/2019, 9:42 PM
Liked "#minebitcoin"

AS Austin Storms <+19853776257> 8/21/2019, 8:44 AM
Looks like GP is still interested in mining

AS Austin Storms <+19853776257> 8/21/2019, 8:50 AM
What are you up to? TA at Lambda or did big tech scoop you up?

BH Ben Hakes <+19522203642> 8/21/2019, 9:59 AM
Yeah - not surprised but they're just slow as molasses

BH Ben Hakes <+19522203642> 8/21/2019, 10:01 AM
Got a few weeks left of TA-ing but got an offer from Coinbase yesterday for an internship-to-hire program.

AS Austin Storms <+19853776257> 8/21/2019, 10:21 AM
Liked "Got a few weeks left of TA-ing but got an offer from Coinbase yesterday for an internship-to-hire program."

AS Austin Storms <+19853776257> 8/21/2019, 10:21 AM



Image: ~/Library/SMS/Attachments/1f/15/30AB2DFB-9E58-4443-BBC7-6A48B6E85C47/IMG_3063.gif (2 MB)

AS Austin Storms <+19853776257> 8/21/2019, 10:21 AM
Love that - just don't work on any of their shitcoin casino stuff Imfao

BH Ben Hakes <+19522203642> 8/21/2019, 10:23 AM
Laughed at an image

BH Ben Hakes <+19522203642> 8/21/2019, 10:24 AM
Ha! Yea we'll see. It's an interesting opportunity but open to other ideas still. My lady got a full-time offer here in Minnesota so gotta take that into consideration as well.

AS Austin Storms <+19853776257> 8/21/2019, 10:24 AM
That's very important to consider. What about remote ops?

BH Ben Hakes <+19522203642> 8/21/2019, 10:25 AM
do you mean something specific with remote ops?

AS Austin Storms <+19853776257> 8/21/2019, 10:26 AM
Like would you consider remote work if the right opportunity came along?

BH Ben Hakes <+19522203642> 8/21/2019, 10:26 AM
Definitely.

AS Austin Storms <+19853776257> 8/21/2019, 10:27 AM
A friend of mine is the recruiter for Entergy's new CUBE team and they're trying to poach me for one of their PM positions - told them they need to hire devs remotely if they want good talent (nobody wants to move to New Orleans) and that Lambda is who I'd source from.

BH Ben Hakes <+19522203642> 8/21/2019, 10:27 AM
Good idea.

BH Ben Hakes <+19522203642> 8/21/2019, 10:28 AM
I don't think people area going to be able to attract talent without remote ops in the future.

AS Austin Storms <+19853776257> 8/21/2019, 10:30 AM
The CUBE team is their "startup culture/thinktank" within the org and has 100% buy-in from C-level. They're doing a full AMI (advanced metering) rollout over the next 2 years and will need big data folks and iOS engineers (the app is total horseshit, take a look at it if you get a chance) to push the strategic org goals to customers.

BH Ben Hakes <+19522203642> 8/21/2019, 10:31 AM
sounds cool

BH Ben Hakes <+19522203642> 8/21/2019, 10:31 AM
how are things going for you? BTW did you ever decide to move somewhere?

AS Austin Storms <+19853776257> 8/21/2019, 10:35 AM
Things are good - had some family stuff come up, met a girl, and I'm staying in NOLA for the foreseeable future.

AS Austin Storms <+19853776257> 8/21/2019, 10:42 AM
What about you? Life's good?

BH Ben Hakes <+19522203642> 8/21/2019, 12:14 PM
Liked "Things are good - had some family stuff come up, met a girl, and I'm staying in NOLA for the foreseeable future."

BH Ben Hakes <+19522203642> 8/21/2019, 12:15 PM
a lady in the picture, eh? I hope she's not a no coiner.... 🤔

BH Ben Hakes <+19522203642> 8/21/2019, 12:16 PM
My lady and I actually got engaged last week! 💎

AS Austin Storms <+19853776257> 8/21/2019, 12:16 PM
I gave her my annotated copy of Economics in One Lesson yesterday, slowly red-pilling her into full-blown libertarianism and Bitcoin.

AS Austin Storms <+19853776257> 8/21/2019, 12:16 PM
Loved "My lady and I actually got engaged last week! 💎"

AS Austin Storms <+19853776257> 8/21/2019, 12:16 PM
Dude congrats!!!!

BH Ben Hakes <+19522203642> 8/21/2019, 12:16 PM
Laughed at "I gave her my annotated copy of Economics in One Lesson yesterday, slowly red-pilling her into full-blown libertarianism and Bitcoin."

AS Austin Storms <+19853776257> 8/21/2019, 12:16 PM
That's huge

BH Ben Hakes <+19522203642> 8/21/2019, 12:16 PM
Thank you!

BH Ben Hakes <+19522203642> 8/21/2019, 12:17 PM
Loved "Dude congrats!!!!"

BH Ben Hakes <+19522203642> 8/21/2019, 12:17 PM
yeah - I'm a lucky guy.

AS Austin Storms <+19853776257> 8/21/2019, 12:17 PM
What does she do? You said she just got an offer in MN?

BH Ben Hakes <+19522203642> 8/21/2019, 12:17 PM
Proposed at her g-mas farm in rural New England. It was solid.

BH Ben Hakes <+19522203642> 8/21/2019, 12:19 PM
Yeah she's in biz school but was to do HR-stuff. I gave her some bitcoin for brunch money when we first started dating... fun to look back on that

BH Ben Hakes <+19522203642> 8/21/2019, 12:19 PM
wants*

AS Austin Storms <+19853776257> 8/21/2019, 12:19 PM
That sounds solid - HR is the heartbeat of any org.

AS Austin Storms <+19853776257> 8/21/2019, 12:20 PM
And bitcoin for brunch money, huh? Sounds like a movie title lol

BH Ben Hakes <+19522203642> 8/21/2019, 12:21 PM
the \$50 worth of eggs and coffee is now worth like \$500

AS Austin Storms <+19853776257> 8/21/2019, 12:22 PM
Now it's 10 more brunch moneys!

AS Austin Storms <+19853776257> 8/21/2019, 12:22 PM
Absolute scarcity is a wild thing, huh?

BH Ben Hakes <+19522203642> 8/21/2019, 12:24 PM
something beautiful about the compounding reflected in both the value and our relationship over time

AS Austin Storms <+19853776257> 8/21/2019, 12:27 PM
Facts. Relationships are the only thing that appreciate better than Bitcoin.

BH Ben Hakes <+19522203642> 8/21/2019, 12:33 PM
Loved "Facts. Relationships are the only thing that appreciate better than Bitcoin."

BH Ben Hakes <+19522203642> 8/21/2019, 12:33 PM
100%

AS Austin Storms <+19853776257> 8/21/2019, 12:35 PM
And I think that's a function of time's perceived scarcity - another philosophical topic that I imagine we're aligned on
haha

BH Ben Hakes <+19522203642> 8/21/2019, 12:39 PM
for sure

AS Austin Storms <+19853776257> 9/6/2019, 1:00 PM
Did you take the Coinbase position? Saw Austen tweeted that they'd filled a spot there with one of y'all Lambda grads.

AS Austin Storms <+19853776257> 9/6/2019, 1:00 PM
👀

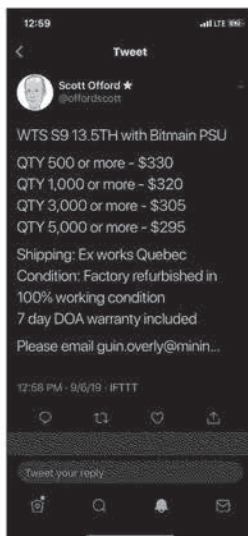


Image: ~/Library/SMS/Attachments/15/05/B4035540-2E88-4584-B023-2148B1AF4D0B/IMG_2634.PNG (424 KB)

BH Ben Hakes <+19522203642> 9/8/2019, 10:47 PM
Yo! Was down in Madison at a college reunion this weekend so just catching back up.

BH Ben Hakes <+19522203642> 9/8/2019, 10:51 PM
I actually did not take the coinbase offer.

It was very tempting, but I got offered a dev position about 2 miles from my apartment that I am pretty excited about. Actually have my first day tomorrow.

BH Ben Hakes <+19522203642> 9/8/2019, 10:53 PM
I'm going to continue to hustle on side projects though.

BH Ben Hakes <+19522203642> 9/8/2019, 10:54 PM
How's everything going with you?

AS Austin Storms <+19853776257> 9/10/2019, 11:40 AM
Liked "I actually did not take the coinbase offer.

It was very tempting, but I got offered a dev position about 2 miles from my apartment that I am pretty excited about. Actually have my first day tomorrow."

AS Austin Storms <+19853776257> 9/10/2019, 11:42 AM
That's fantastic dude. And everything's good. Got an offer to go up to Lexington and come on board to a friend's startup that I'm probably gonna take and still hustle on some BTC side projects.

BH Ben Hakes <+19522203642> 9/11/2019, 8:07 AM
That's sweet man. What does that start up do?

Let me know if you get any ideas for mobile apps, especially for BB that you'd want to prototype. I could potentially prototype or design some stuff.

AS Austin Storms <+19853776257> 9/11/2019, 8:08 AM
Liked "That's sweet man. What does that start up do?

Let me know if you get any ideas for mobile apps, especially for BB that you'd want to prototype. I could potentially prototype or design some stuff."

AS Austin Storms <+19853776257> 9/11/2019, 8:10 AM
Modular mobile apps. Something like "platform as a service."

BH Ben Hakes <+19522203642> 9/11/2019, 8:14 AM
Liked "Modular mobile apps. Something like "platform as a service." "

AS Austin Storms <+19853776257> 9/11/2019, 8:15 AM
Their big prod is a mobile first salesforce, but that's going to take another 6 mos to finish. He wanted me as their enterprise blockchain guy, I told him only Bitcoin stuff. Probably going to do a Microsoft ION integration as well (he's also the state director in KY for their IAMS).

BH Ben Hakes <+19522203642> 9/11/2019, 8:43 AM
Cool. What is IAMS?

AS Austin Storms <+19853776257> 9/11/2019, 8:51 AM
Identity access mgmt

BH Ben Hakes <+19522203642> 9/11/2019, 9:27 AM
Liked "Identity access mgmt"

AS Austin Storms <+19853776257> 9/11/2019, 1:55 PM
Network hashrate went over estimated 102 EH/s briefly this morning ☹️

BH Ben Hakes <+19522203642> 9/11/2019, 4:18 PM
Dang... what's your profitability model looking like right now? I'd be interested in \$/kwh

BH Ben Hakes <+19522203642> 9/11/2019, 4:18 PM
Seems like peeps are getting their last run in before the halvening?

AS Austin Storms <+19853776257> 9/11/2019, 4:22 PM
Looks like S9 rev is still breakeven at ~\$.072/kWh

AS Austin Storms <+19853776257> 9/11/2019, 4:23 PM
When that gets to \$.035-.04/kWh, those machines start turning off and difficulty should drop a good bit. I don't expect that until 130EH/s, probably late Oct/early Nov if we stay in this \$10k range

AS Austin Storms <+19853776257> 9/11/2019, 4:28 PM

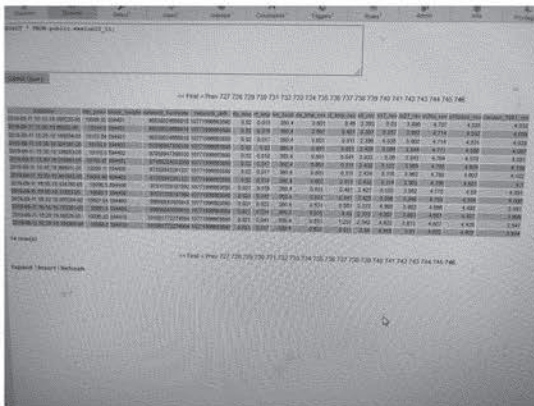


Image: ~/Library/SMS/Attachments/20/00/F0F9B146-CF5E-4850-940B-5361CC1EBE98/58993006866__69A141C5-6119-4687-AFE6-4F319B00AD8E.JPG (6 MB)

BH Ben Hakes <+19522203642> 9/11/2019, 4:29 PM
Liked "When that gets to \$.035-.04/kWh, those machines start turning off and difficulty should drop a good bit. I don't expect that until 130EH/s, probably late Oct/early Nov if we stay in this \$10k range"

BH Ben Hakes <+19522203642> 10/15/2019, 12:18 PM
https://fortune.com/2019/10/15/what-is-bitcoin-mining-layer1-peter-thiel-crypto-investment/amp/?__twitter_impression=true

AS Austin Storms <+19853776257> 10/15/2019, 12:20 PM
Yep - talked with Alex a few weeks ago. They've got a good team but he's not experienced and they made some false claims in their deck...

AS Austin Storms <+19853776257> 10/15/2019, 12:21 PM
Terrance Yang was in their seed round at Layer1 Capital and sent me the deck/setup the call for some due diligence questions. Their team is entirely offshore and R&D is in Moscow/Shenzhen. Can send you the deck if you want

AS Austin Storms <+19853776257> 10/15/2019, 12:46 PM

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Attachment: ~/Library/SMS/Attachments/a/7/07/ECC324BC-0B58-49F1-80BC-A991A4FA4F93/Layer1 Technologies Inc. Deck.pdf (2 MB)

BH Ben Hakes <+19522203642> 10/15/2019, 2:20 PM
📎

AS Austin Storms <+19853776257> 10/15/2019, 2:21 PM
And I just got access to the Crusoe Energy/Upper90 deck for their series A.

BH Ben Hakes <+19522203642> 10/15/2019, 2:37 PM
Are they mining as well?

AS Austin Storms <+19853776257> 10/15/2019, 2:38 PM
Yea that's the Bain Capital/Winklevoss backed startup operating off of flared natural gas in WY, CO, and the Dakotas.

BH Ben Hakes <+19522203642> 10/15/2019, 2:51 PM
Big boys are legging in

AS Austin Storms <+19853776257> 10/15/2019, 2:52 PM
Yep - just emailed GP team.

AS Austin Storms <+19853776257> 4/29/2020, 10:08 AM
Yo

BH Ben Hakes <+19522203642> 4/29/2020, 10:35 AM
Yo whats happenin

AS Austin Storms <+19853776257> 4/29/2020, 10:38 AM
Just checking in to see what you've been up to! Still doing iOS engineering?

BH Ben Hakes <+19522203642> 4/29/2020, 10:44 AM
Yeah man - we've got a greenfield app that's about to get released at work - great learning experience. Have taken break from side projects while I learn some new mobile architectures but am going to start building some new apps soon.

BH Ben Hakes <+19522203642> 4/29/2020, 10:45 AM
How bout you?

BH Ben Hakes <+19522203642> 4/29/2020, 10:45 AM
Side note - super pumped for the halvening

AS Austin Storms <+19853776257> 4/29/2020, 10:51 AM
Liked "Yeah man - we've got a greenfield app that's about to get released at work - great learning experience. Have taken break from side projects while I learn some new mobile architectures but am going to start building some new apps soon."

AS Austin Storms <+19853776257> 4/29/2020, 10:55 AM
Fantastic - greenfield like from scratch? I'm not as familiar with mobile dev.

AS Austin Storms <+19853776257> 4/29/2020, 10:57 AM
Staying busy on the mining side - got brought on early to the GAM team last year and we're solving the flared natural gas problem for O&G producers and expanding into other renewable verticals that make sense.

I'm about to reach out to the GlidePath team again to check their pulse.

AS Austin Storms <+19853776257> 4/29/2020, 10:58 AM
I'm also super excited for the halvening - there are a LOT of S9's still operating that need to come off. Average TH/s on Slushpool is 33TH/s - that needs to get to the 50TH/s range before we can really take off.

BH Ben Hakes <+19522203642> 4/29/2020, 11:04 AM
Liked "Staying busy on the mining side - got brought on early to the GAM team last year and we're solving the flared

natural gas problem for O&G producers and expanding into other renewable verticals that make sense.

I'm about to reach out to the GlidePath team again to check their pulse."

BH Ben Hakes <+19522203642> 4/29/2020, 11:05 AM
Yeah - the new app is being built from scratch.

BH Ben Hakes <+19522203642> 4/29/2020, 11:05 AM
Does GAM stand for something?

AS Austin Storms <+19853776257> 4/29/2020, 11:06 AM
Liked "Yeah - the new app is being built from scratch."

AS Austin Storms <+19853776257> 4/29/2020, 11:06 AM
Great American Mining

BH Ben Hakes <+19522203642> 4/29/2020, 11:07 AM
Ahh yeah.

You should reach out to GP, however I did get a message from Mike H. a couple months ago and said that he was no longer with GlidePath (I think he was getting bored). That's not necessarily a bad thing tho as Dan was really the shot caller there.

BH Ben Hakes <+19522203642> 4/29/2020, 11:08 AM
People still running S9's?! Jeeze

BH Ben Hakes <+19522203642> 4/29/2020, 11:09 AM
Lol

AS Austin Storms <+19853776257> 4/29/2020, 11:10 AM
Emphasized "Ahh yeah.

You should reach out to GP, however I did get a message from Mike H. a couple months ago and said that he was no longer with GlidePath (I think he was getting bored). That's not necessarily a bad thing tho as Dan was really the shot caller there."

AS Austin Storms <+19853776257> 4/29/2020, 11:10 AM
Bored?!? Lol

AS Austin Storms <+19853776257> 4/29/2020, 11:10 AM
And yes, people are still running S9's - either really cheap power or just laundering via mining.

BH Ben Hakes <+19522203642> 4/29/2020, 11:11 AM
Haha yeah I'm not sure... looking back, he might of wished he'd kept the steady paycheck

AS Austin Storms <+19853776257> 4/29/2020, 11:12 AM
I think there's a lot of folks in hindsight who wish they'd have done that!

BH Ben Hakes <+19522203642> 4/29/2020, 11:13 AM
Haha for sure! Also, Just seeing this 8Hut coindesk piece

AS Austin Storms <+19853776257> 4/29/2020, 11:14 AM
Yea I read it this morning - Hut8 is in trouble.

AS Austin Storms <+19853776257> 4/29/2020, 11:14 AM
Too much capex spend

AS Austin Storms <+19853776257> 4/29/2020, 11:14 AM

Too much burn

BH Ben Hakes <+19522203642> 4/29/2020, 11:14 AM
They were always too suit and tie for me

BH Ben Hakes <+19522203642> 4/29/2020, 11:15 AM
Had my doubts they could pull it off

AS Austin Storms <+19853776257> 4/29/2020, 11:18 AM
Liked "They were always too suit and tie for me"

AS Austin Storms <+19853776257> 4/29/2020, 11:18 AM
100%

AS Austin Storms <+19853776257> 4/29/2020, 11:18 AM
Trying to teach the GAM guys that burning capital for anything non-essential is bad bad in this industry.

BH Ben Hakes <+19522203642> 4/29/2020, 11:55 AM
Liked "Trying to teach the GAM guys that burning capital for anything non-essential is bad bad in this industry."

BH Ben Hakes <+19522203642> 4/29/2020, 11:55 AM
Bitcoin is a teacher

BH Ben Hakes <+19522203642> 4/29/2020, 11:56 AM
Hard for guys that have been around funny money spaces like investment banking / PE all their life

AS Austin Storms <+19853776257> 4/29/2020, 11:56 AM
No doubt. It's ruthless capitalism

AS Austin Storms <+19853776257> 4/29/2020, 11:57 AM
The Crusoe Energy guys are in big big trouble - too much burn with a 25+ man team and their model is contingent on O&G producers paying them.

A lot of ppl are about to get taught

BH Ben Hakes <+19522203642> 4/29/2020, 11:58 AM
Yup. They can't rely on their Cantillon supremacy anymore.

AS Austin Storms <+19853776257> 4/29/2020, 11:58 AM
Facts.

BH Ben Hakes <+19522203642> 4/29/2020, 11:58 AM
Rekt

AS Austin Storms <+19853776257> 4/29/2020, 12:01 PM
Bigly rekt.

AS Austin Storms <+19853776257> 4/29/2020, 12:01 PM
That's why I was so crazy about the GP team and them not deploying old gen miners even though they were cheap and power was essentially free.

AS Austin Storms <+19853776257> 4/29/2020, 12:01 PM
Hard paradigm shift to make though.

AS Austin Storms <+19853776257> 5/22/2020, 10:39 AM
<https://www.prnewswire.com/news-releases/layer1-launches-bitcoin-batteries-to-stabilize-energy-grids-by-releasing-electricity-to-meet-market-demand-301063984.html>

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AS Austin Storms <+19853776257> 5/22/2020, 10:39 AM
This is load as a service.

BH Ben Hakes <+19522203642> 5/23/2020, 4:54 PM
"Layer1's proprietary demand-response software"

BH Ben Hakes <+19522203642> 5/23/2020, 4:54 PM
... like a few lines of python 🤖

AS Austin Storms <+19853776257> 5/23/2020, 4:55 PM
Literally less than 100 to kill all of the power

BH Ben Hakes <+19522203642> 5/23/2020, 4:55 PM
Lol

AS Austin Storms <+19853776257> 5/23/2020, 4:55 PM
Denis and the GP team got back to me and said they reviewed the models and it wasn't enticing enough for them.

AS Austin Storms <+19853776257> 5/23/2020, 4:55 PM
Looking for a 2 year payback.

BH Ben Hakes <+19522203642> 5/23/2020, 4:56 PM
Huh...

BH Ben Hakes <+19522203642> 5/23/2020, 4:56 PM
"The increased installation of renewable energy production capacity will require increased demand response services from companies like Layer1,"

AS Austin Storms <+19853776257> 5/23/2020, 4:57 PM

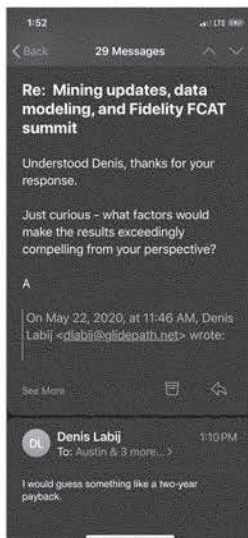


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BH Ben Hakes <+19522203642> 5/23/2020, 4:57 PM
Can't say we were off

AS Austin Storms <+19853776257> 5/23/2020, 4:57 PM
You were dead on.

AS Austin Storms <+19853776257> 5/23/2020, 4:57 PM
I just build the stuff.

BH Ben Hakes <+19522203642> 5/23/2020, 4:57 PM
Liked an image

BH Ben Hakes <+19522203642> 5/23/2020, 4:58 PM
Would be interesting to hear denis's response

BH Ben Hakes <+19522203642> 5/23/2020, 4:58 PM
I think they just don't have the pocketbook or the risk capital to be that entrepreneurial

AS Austin Storms <+19853776257> 5/23/2020, 4:58 PM



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AS Austin Storms <+19853776257> 5/23/2020, 4:58 PM
Designed and built these PDUs for GAM recently.

AS Austin Storms <+19853776257> 5/23/2020, 4:58 PM

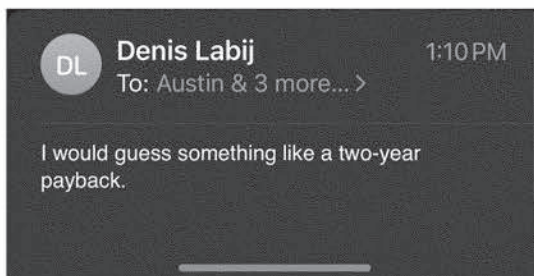


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AS Austin Storms <+19853776257> 5/23/2020, 4:58 PM
Yea it's too much risk I think.

BH Ben Hakes <+19522203642> 5/23/2020, 4:58 PM
Ooh

BH Ben Hakes <+19522203642> 5/23/2020, 4:58 PM
I see

BH Ben Hakes <+19522203642> 5/23/2020, 4:59 PM
Ya they're working with institutional money too

BH Ben Hakes <+19522203642> 5/23/2020, 4:59 PM
If it was all their own they might do it

BH Ben Hakes <+19522203642> 5/23/2020, 4:59 PM
Reputation risk of crypto is real, though it's diminishing in finance right now

BH Ben Hakes <+19522203642> 5/23/2020, 5:00 PM
Of course in the long run I think we're right but sort term we might look stupid for a bit

BH Ben Hakes <+19522203642> 5/23/2020, 5:00 PM
Emphasized an image

BH Ben Hakes <+19522203642> 5/23/2020, 5:00 PM
Those PDUs are dope man!

AS Austin Storms <+19853776257> 5/23/2020, 5:12 PM
Loved "Of course in the long run I think we're right but sort term we might look stupid for a bit"

AS Austin Storms <+19853776257> 5/23/2020, 5:13 PM
That's usually how all great ideas are in the beginning

AS Austin Storms <+19853776257> 5/23/2020, 5:13 PM
Thanks! They're 480Y/277VAC rated 🌀

BH Ben Hakes <+19522203642> 5/23/2020, 5:14 PM
There was one quote from Thiel, or Paul Graham saying that one market of most successful people is their willingness to look stupid in the short term...

BH Ben Hakes <+19522203642> 5/23/2020, 5:15 PM
👍👍

AS Austin Storms <+19853776257> 5/23/2020, 5:28 PM
No doubt

AS Austin Storms <+19853776257> 2/28/2021, 1:06 PM
Yo

BH Ben Hakes <+19522203642> 2/28/2021, 1:07 PM
Yo - love that thread today man

AS Austin Storms <+19853776257> 2/28/2021, 1:07 PM
Thanks dude. I've been heavy in the weeds for the past year trying to sort out the energy + mining relationship

AS Austin Storms <+19853776257> 2/28/2021, 1:07 PM
The GAM stuff is wild - have been on ND 20+ days this month deploying on wellpads

AS Austin Storms <+19853776257> 2/28/2021, 1:08 PM
You saw that wildness in ERCOT a few weeks ago?

BH Ben Hakes <+19522203642> 2/28/2021, 1:08 PM
Freakin love it

BH Ben Hakes <+19522203642> 2/28/2021, 1:08 PM
Yeah - that was insane

AS Austin Storms <+19853776257> 2/28/2021, 1:09 PM
Not a good week to be a Bitcoin miner down there

AS Austin Storms <+19853776257> 2/28/2021, 1:09 PM
There, MISO, or SPP

BH Ben Hakes <+19522203642> 2/28/2021, 1:10 PM
For sure, and you've got to send it all to the grid at \$9000 per MWh of w/e the heck it got to

AS Austin Storms <+19853776257> 2/28/2021, 1:10 PM
Laughed at "For sure, and you've got to send it all to the grid at \$9000 per MWh of w/e the heck it got to"

AS Austin Storms <+19853776257> 2/28/2021, 1:10 PM
Too bad Denis and team at GlidePath didn't go with the M20S pilot they would've ROI'd so quickly

BH Ben Hakes <+19522203642> 2/28/2021, 1:10 PM
Lol

AS Austin Storms <+19853776257> 2/28/2021, 1:11 PM
Not many people doing demand response with PPA/POA on ERCOT

BH Ben Hakes <+19522203642> 2/28/2021, 1:11 PM
You think that'll change?

AS Austin Storms <+19853776257> 2/28/2021, 1:11 PM
Not effectively at least - Lancium locked it all up with a patent and they're a bunch of fucking morons

BH Ben Hakes <+19522203642> 2/28/2021, 1:11 PM
Wtf

BH Ben Hakes <+19522203642> 2/28/2021, 1:11 PM
That's shitty

AS Austin Storms <+19853776257> 2/28/2021, 1:12 PM
Confidentially, I'm challenging it in federal court.

Suit should be filed soon.

BH Ben Hakes <+19522203642> 2/28/2021, 1:12 PM
Damn! I'll get the popcorn ready...

AS Austin Storms <+19853776257> 2/28/2021, 1:13 PM
Because I tried to sell it to him 6 months before he applied for the patent and he filed another patent that was recently published but not granted for the behind the meter application that was *exactly* what I tried to sell to him with the BearBox LaaS software and hardware integration I built

BH Ben Hakes <+19522203642> 2/28/2021, 1:14 PM

What a dick

AS Austin Storms <+19853776257> 2/28/2021, 1:14 PM
Yea I know dude, I'm going for his neck and will blackball him out of the entire industry - no bad actors.

AS Austin Storms <+19853776257> 2/28/2021, 1:14 PM
What have you been up to?

BH Ben Hakes <+19522203642> 2/28/2021, 1:17 PM
Still working for this AgTech startup in Minny. Got promoted to lead iOS eng after some attrition. Working on a couple side projects and recently have been talking with Alex and River about joining them.

BH Ben Hakes <+19522203642> 2/28/2021, 1:19 PM
We moved too so I went heavy into the home gym setup.



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AS Austin Storms <+19853776257> 2/28/2021, 1:19 PM
Loved "Still working for this AgTech startup in Minny. Got promoted to lead iOS eng after some attrition. Working on a couple side projects and recently have been talking with Alex and River about joining them."

AS Austin Storms <+19853776257> 2/28/2021, 1:19 PM
Loved an image

BH Ben Hakes <+19522203642> 2/28/2021, 1:20 PM
Hopefully we don't need another car for a while.

AS Austin Storms <+19853776257> 2/28/2021, 1:20 PM
Love that! The River team is very good tmk

AS Austin Storms <+19853776257> 2/28/2021, 1:20 PM
And home gyms were more scarce than Bitcoin last year - glad you got one setup!

BH Ben Hakes <+19522203642> 2/28/2021, 1:22 PM
Yeah man - paying the shipping costs on my bumper plates felt like paying shipping for some ASICS

BH Ben Hakes <+19522203642> 2/28/2021, 1:23 PM
If you ever come through Minny hit me up and we can workout

AS Austin Storms <+19853776257> 2/28/2021, 1:23 PM
Hahaha I bet - it's been brutal getting things out of China for the last year

AS Austin Storms <+19853776257> 2/28/2021, 1:23 PM
Liked "If you ever come through Minny hit me up and we can workout"

AS Austin Storms <+19853776257> 2/28/2021, 1:24 PM
Absolutely dude - would love to crush some burpees in there

BH Ben Hakes <+19522203642> 2/28/2021, 1:24 PM
Lol

AS Austin Storms <+19853776257> 2/28/2021, 1:25 PM
And lmk how it goes with the River stuff - we're about to start expanding our core team and I could always use another software engineer, I'm currently writing everything hahaha

BH Ben Hakes <+19522203642> 2/28/2021, 1:26 PM
Liked "And lmk how it goes with the River stuff - we're about to start expanding our core team and I could always use another software engineer, I'm currently writing everything hahaha"

BH Ben Hakes <+19522203642> 2/28/2021, 1:28 PM
Will do. It'd be great to get back into the game, but being patient.

BH Ben Hakes <+19522203642> 2/28/2021, 1:29 PM
I'm also starting to look at some part time contract work on the side with a local dev I trust a lot. If you guys ever wanted something mobile especially we could chat.

AS Austin Storms <+19853776257> 2/28/2021, 1:30 PM
Loved "I'm also starting to look at some part time contract work on the side with a local dev I trust a lot. If you guys ever wanted something mobile especially we could chat. "

AS Austin Storms <+19853776257> 2/28/2021, 1:30 PM
Always - if anything, we normally start folks with contract work to see if they are a good fit with the team culture and bring them on full-time after 12 months.

BH Ben Hakes <+19522203642> 2/28/2021, 1:30 PM
Liked "Always - if anything, we normally start folks with contract work to see if they are a good fit with the team culture and bring them on full-time after 12 months."

AS Austin Storms <+19853776257> 2/28/2021, 1:31 PM
That's how it happened with me and I had another job full-time while I was getting paid for the side work w GAM

BH Ben Hakes <+19522203642> 2/28/2021, 1:32 PM
Best way to go IMHO

AS Austin Storms <+19853776257> 2/28/2021, 1:33 PM
Agreed

BH Ben Hakes <+19522203642> 4/27/2021, 10:30 PM
Thought you'd like

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AS Austin Storms <+19853776257> 4/27/2021, 10:32 PM
Hahaha very accurate

AS Austin Storms <+19853776257> 4/28/2021, 8:00 AM
FYI I filed a federal lawsuit against Lancium and McNamara two weeks ago for them patenting the demand response for Bitcoin miners with a PPA/POA... 5 months after I tried to sell him the container with all of the software and hardware integrations I'd written. 🙄

BH Ben Hakes <+19522203642>

4/28/2021, 10:50 AM

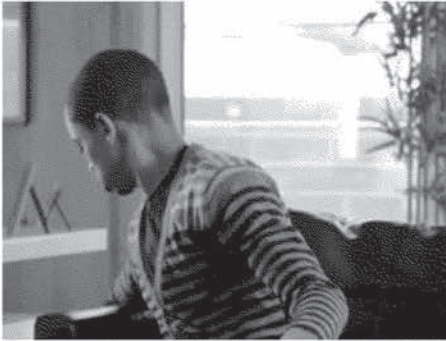


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BH Ben Hakes <+19522203642>
Fuck 'em

4/28/2021, 10:50 AM

BH Ben Hakes <+19522203642>
I'll be cheering you on

4/28/2021, 10:50 AM

AS Austin Storms <+19853776257>
Thanks dude

4/28/2021, 11:46 AM